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# Railway Age

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Vol. 89

September 27, 1930

No. 13

## In this Issue

### Handling Fourteen Thousand Ton Trains ..... Page 609

Tells how the Great Northern handles speedily and safely the heavy ore traffic between the Mesabi range in Minnesota and its ore docks at Allouez, Wis., at the head of the Great Lakes.

### Railway Shop Men Review Supply Problems ..... 613

An article reviewing an analysis of delay costs and a workable plan for avoiding material shortages, outlined last week at the annual convention of the International General Foremen's Association.

### New Wabash Locomotives Make Good in Service Tests ... 616

In actual service on fast freight trains, 25 Baldwin locomotives of the 4-8-2 type, delivered to the Wabash early this year, have shown a 22 per cent increase in capacity and fuel economy as compared with the locomotives replaced.

#### EDITORIALS

The Government and Railroad Employment .....	605
Buying Supplies Locally .....	606
Pooling Cabooses .....	607
Adequate Maintenance and Renewal Always Important .....	607
Why Not Try to Attract Tourists from Europe? .....	608

#### GENERAL ARTICLES

Handling Fourteen Thousand Ton Trains .....	609
Larger Electric Locomotives for the N. Y., N. H. & H. ....	612
Railway Shop Men Review Supply Problems .....	613
New Wabash Locomotives Make Good in Service Tests .....	616
Roadmasters' Hold 48th Convention .....	619
Freight Car Loading .....	623
Communication Officers Meet in Toronto .....	624
Accidents Investigated in February and March .....	627
Burlington Operating Efficiently .....	629

### LOOKING BACKWARD ..... 632

### COMMUNICATIONS AND BOOKS ..... 633

### ODDS AND ENDS OF RAILROADING ..... 634

### NEWS ..... 635

The Railway Age is indexed by the Industrial Arts Index and also by the Engineering Index Service

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# Railway Age

Vol. 89, No. 13

September 27, 1930

Table of Contents Appears on  
Page 5 of Advertising Section

## The Government and Railroad Employment

**E**NCOURAGING evidence that leaders of railway labor organizations are alive to the effects being produced on railroad employment by the competition of other means of transportation is afforded by resolutions adopted recently by the general chairmen of the Brotherhood of Railroad Trainmen regarding the development of pipe lines. A summary of these resolutions was published in the *Railway Age* of September 13, page 547.

The means of transportation that are diverting large amounts of traffic from the railways, and are threatening to divert more, include pipe lines, motor coaches and motor trucks, and carriers by water and air. The advent of the railways reduced transportation by other means because the railways could render better service at a lower cost. The railways themselves must give way when other means of transportation are developed which can render as good or better service at less cost. The attitude that some railways, influenced by competition with other railways, have assumed toward the development of pipe lines affords, however, a good illustration of the way in which railways are disposed to cut each other's throats to win the favor of big shippers. The long, continuous stretches of land included in railway rights of way afford the best places for laying pipe lines. An attempt was made to get one group of railways to agree, for their own protection, not to allow their rights of way to be thus used. Two railways refused to agree to this and in consequence apparently some of them are going to allow oil companies to use their rights of way. Perhaps these railways will get their reward in the form of larger shipments of such oil as moves by rail, but when railways allow pipe line companies, because they are controlled by big shippers, to come upon their own rights of way to take their traffic from them, the evidence of the disposition of railways to bow to the power of big shippers becomes only too conclusive.

### *Government-Aided Competition*

There is a wide difference, however, between pipe line competition and some other forms of competition. Pipe lines are built with private capital, and under favorable conditions can transport oil cheaper than rail-

ways. Other competing means of transportation are being enabled to take a large part of the traffic they are taking because of direct or indirect government aid. Highways constructed and maintained at public expense are enabling motor vehicles to take increasing amounts of passenger and freight business. According to the most reliable estimates, the total taxes paid by the owners of motor coaches and trucks average about 5 per cent of their total earnings. The railways provide their own highways at the cost of about one-third of their total earnings, and in addition pay taxes amounting to 6½ per cent of their total earnings. It would seem that when an industry that provides and maintains its own highway pays a larger proportion of its total earnings in taxes than competitors that have their highways provided and maintained at public expense, these competitors must, generally speaking, be paying less than nothing for the use of the highways. If any spokesman of the motor coach and truck interests will send the *Railway Age* a communication showing either that these figures are wrong, or that the conclusion drawn from them is erroneous, we will be glad to publish it.

Both those who own and operate railways and those who own and operate motor coaches and trucks are engaged in business for profit. Why, then, should the government so aid and regulate, or fail to regulate, operators of motor vehicles as to enable them to take traffic from the railways which the railways could handle at a lower total economic cost, when the effect is not only to reduce railway traffic, but, also, to reduce the number of persons the railways can employ?

### *Railway Employees and Waterways*

The policy of the government in regard to waterways is still more unsound economically and unfair to both the railways and their employees. It furnishes highways to inland water carriers entirely free. It is operating a barge line on the Mississippi river which, on the average, has not even earned its operating expenses, much less any interest on the investment in its facilities, and which in consequence constantly incurs large deficits which are defrayed by the taxpayers. It is proposing

to spend hundreds of millions of dollars upon deepening other waterways, at the cost of the taxpayers, the use of which will be given free to water carriers, including the government's barge line. Obviously, carriers by water can and will, when aided by this government policy, make lower rates than the railways, take traffic from them, and thereby reduce the number of persons the railways can employ. Finally the government refuses to let the railways make lower rates to the Pacific Coast to meet steamship competition through the Panama canal than they make to intermediate points, although the effect plainly is to divert traffic from the railways and reduce the number of persons that they can employ.

These forms of competition with the railways mentioned are being fostered, not by private capital, but by the national and state governments from whom all citizens, including railway employees, are entitled to receive fair and equal treatment. The right of railway employees to protest against government policies which threaten their employment is clear, and their protests could be made much more effective than any they can raise against the policies of oil companies. Political influence is largely responsible for the governmental promotion of other forms of competition with the railways. Railway labor leaders and employees have political influence that they could use to combat the political influence that is being used to their detriment. Other persons have no more right to use political influence to injure railway employees than the employees have to use it to protect themselves. Even in 1929 the railways had 193,000 less employees than in 1923, and the number in 1930 has thus far averaged over 300,000 less than in 1923. As the *Railway Age* previously has shown, the decline in number of employees has been largely due to influences affecting the volume of railway traffic.

### *Labor Leaders and Politicians*

Curiously enough, however, while railway employees have made organized efforts on a national scale for other purposes, they have never used them to combat government policies that divert traffic from the railways. There are many politicians who are active in promoting every government policy that has this effect, but who at the same time profess to be ardent friends of railway employees and thereby get the votes of many of them. Many railway labor leaders are right now supporting for election to Congress many politicians who have favored every form of government policy that has tended to divert traffic from the railways and thereby to reduce railroad employment.

Is it possible that railway labor leaders are supporting certain politicians merely because, being radicals, they are enemies of the railways, and in total disregard of the effect that their policies have upon railroad employment? Western radicals, such as Senators Brookhart of Iowa and Norris of Nebraska, are among the most

ardent supporters of waterways. Senator Brookhart not long ago was quoted as saying that it might not be long until the country would have no need of railways. Of course, it would then have no need of railway employees. Nevertheless, Brookhart owes his seat in the Senate largely to the vote of railway employees and continues to be one of the most beloved political associates of most railway labor leaders.

Railway labor leaders and employees are feeling and expressing much concern regarding the decline of railroad employment. They have themselves largely to blame for present conditions because of their past failure to oppose certain government policies and politicians that have favored them. Unless they make an organized effort to arrest the still prevailing tendencies of the national and state governments to foster competition with the railways, they will have no good reason for complaining about the effects produced by these tendencies upon railroad employment in future.

## Buying Supplies Locally

THE departure of a terminal company in one of the large cities from the practice of obtaining all of its supplies through the central purchasing office and stores depot of one of the owning roads for that of obtaining a prescribed list of supplies from local merchants is a highly significant development in railway supply work in view of the vigor with which the railways have been advancing the cause of centralization in this branch of business. It suggests that the agitation for centralization in purchasing and stores operations and control has about spent itself and that the responsible officers are now beginning to go back over the ground and make adjustments and allowances here and there in their plans of improving supply work.

The theory of centralization in the railway supply field is that it will afford better prices, lower inventories, smaller investments in facilities and more efficient service. With centralization in other branches of railway work demanding centralization of supply work, in some instances, and serving as an example of the good to be accomplished, in other instances, and with the progress in centralized supply work also affording abundant evidence of the advantages to be gained, it was natural that centralization should become popular and greatly sought after. At all events, recent years have seen centralization and super-centralization in almost every phase of railway supply work. But experience in centralization, as in other fields of business experimentation, has clearly demonstrated that the policy of centralization is not so perfect but that it can actually create expenses and difficulties which it was sought to prevent. Like everything else, it is a principle that can be carried too far, and it is salutary that railway supply officers are beginning to agree on this point.

In the particular case mentioned, the terminal company found that with certain articles used by the railroad in common with other business, the railroad could, by the simple expedient of a telephone conversation with an accredited hardware store or a local merchant, actually buy these staple supplies in the quantity desired at the moment as cheaply as they were previously being bought through the central office, while the added advantages were obtained of getting immediate deliveries without having to anticipate the need for these supplies weeks in advance, without having to send out inquiries for bids with each order and without having to carry any stock. Here was a case where the practice of centralization apparently warranted some modification, and attests to the fact that the opportunities for localized buying as against centralized buying may well afford exploration.

## Pooling Cabooses

THE development of long locomotive runs and of maintracking arrangements should be paralleled by another development. The pooling of cabooses is a step that is in accord with the trend of the times. The entire course of railroading is now being directed toward the elimination of unnecessary switching, and through this to bring about a reduction in terminal delays.

Changing cabooses takes time and not infrequently involves an extra switching movement. Under present operating conditions it is not unusual for such a change to be the only switching done in the handling of fast through freight trains in one or more terminals. Of course, at terminals where the train is entirely broken up and rebuilt again for outbound movement, changing the cabooses represents little extra work or time, but such operations at intermediate terminals are becoming much less common than they used to be.

As an example of how pooling cabooses would save time and money, a certain turn-around run may be cited. On this run the inbound engine crew walks across the yard and boards another engine which is in readiness, coupled on an outbound train. Then they have to wait while a switching engine takes the caboose around a wye and couples it on to the outbound train. Not only does this delay the departure of the train, but it also takes up the time of the switching engine and crew, which, in this busy terminal, might better be employed in other activities. There is also the further factor that the large amount of track room necessary for turning the cabooses must be kept clear at all times, in anticipation of such movements.

There are more and more cases where the pooling of cabooses would save time and money. The use of cabooses as traveling dormitories at away-from-home-terminals is diminishing and there seems to be no other

argument against pooling where its use would result in savings, except the reason that used to be advanced when the pooling of engines first began to be widespread, namely that, with cabooses assigned, the crew will keep them in better condition. This argument may have carried some weight in the old days but with the number of new cabooses in service, the small amount of extra supervision necessary to insure that they will be kept in good condition is more than justified by the results obtained by pooling. Efficiency in railroading is, after all, not an individual affair, but results only from properly directed collective effort.

## Adequate Maintenance and Renewal Always Important

THE total cost of any capital facility is its direct cost of operation, plus maintenance expense, plus depreciation (at a rate to insure its retirement when it becomes obsolete or worn out) and a fair return on the original investment in the facility.

For practical purposes, there might be no charge to depreciation, and none is necessary provided retirements are kept up regularly. Charges to depreciation or retirement, however, are legitimate operating expenses and should at all times be adequate. Unless charges for depreciation and retirement are sufficient to cover actual obsolescence and decline in serviceability, then net earnings will be overstated. Thus, dividends may be paid, or a corporate surplus built up, not from bona fide net earnings, but by the withdrawal of invested capital—a dangerous practice.

Obsolescence may come more rapidly than expected under a program of depreciation or retirement. In such a situation, acknowledgment of the condition by a frank charge-off to profit and loss of facilities which ought to be retired may be the only wise course to follow.

When is a facility obsolete? It is obsolete when the work which it was designed to do is no longer required of it. Or it is obsolete when a newer facility is available which will do its work at a lower total cost. It is obsolete when dollars charged out for its retirement and replacement by a new unit will save still more dollars of expenses necessary to maintain it in operation.

Such considerations as these, while elementary, are nevertheless fundamental and important, especially during a period of low earnings. At such a time there exists a powerful motive for curtailing immediate expense, regardless of how wise it might be from the standpoint of ultimate economy. Extreme conservation of ready resources may be necessary in some cases at such a time. On the other hand, a too-penurious policy certainly results in an overstatement of earnings and



restricts more efficient operation later on. Should the railroads risk giving the public the impression that they are weathering present conditions better than they actually are? Adequate maintenance, and prompt retirement of obsolete facilities at a rate to keep railway plant up to the highest standard of efficiency, are requirements of sound economics. Expediency might necessitate overlooking temporarily their vital importance—but a step in this direction should be taken only with a full recognition of its seriousness.

## Why Not Try to Attract Tourists from Europe?

**I**N a recent issue of the New York Times appeared a letter from an Englishman traveling in the United States, the point of view of which appears so pertinent to the passenger traffic situation in this country that we reproduce it herewith virtually in full.

My first and much postponed visit here [i.e., in the United States] has very much surprised me from two points of view: 1. The wonderful and varied country which the United States can offer to Europeans; 2. The unexpectedly cheap cost of travel in this country.

It seems to me amazing that no official effort is made to attract visitors to the United States, such as is hectically done by the Syndicats d'Initiative of almost every town which has anything in the least degree of interest to offer tourists in Europe.

I risked coming over here in spite of rumors of Red Indians, chewing gum, millionaire-priced hotels, prohibition and smoky manufacturing towns. Instead of these I discovered some of the most beautiful and interesting country I have ever seen, and made the acquaintance of some of the most delightfully hospitable people it has ever been my pleasure to meet.

Where in Europe can you find the majesty of the Rocky Mountains, the wonders of the canyons of Yellowstone Park and such variety as on a trip from New York to Los Angeles? Where in England—or in fact in any other European country—can you find up-to-date hotels and rooms with private baths, showers, and a host of other modern equipment at a cost of 9 shillings a day? If these exist in Europe, I, for one, would be very pleased to hear about them.

In spite of this, very little effort is apparently made to attract people here. I know of no office in either London, Paris or Berlin, where one can obtain any reliable information on touring in America, outside of the steamship offices—whose only interest is to get people across the Atlantic and leave them high and dry at the Battery and Broadway.

Both English and German people have a reputation for being great travelers. They take their vacations in such distant countries as South Africa, Egypt, India, and even so far as Australia, and are always looking for new places to visit.

Why should not they come to America on an equally interesting and less frequented trip at less expense and in less time? Were they to do so, I venture to suggest that a number of existing misunderstandings might be removed on both sides of the pond.

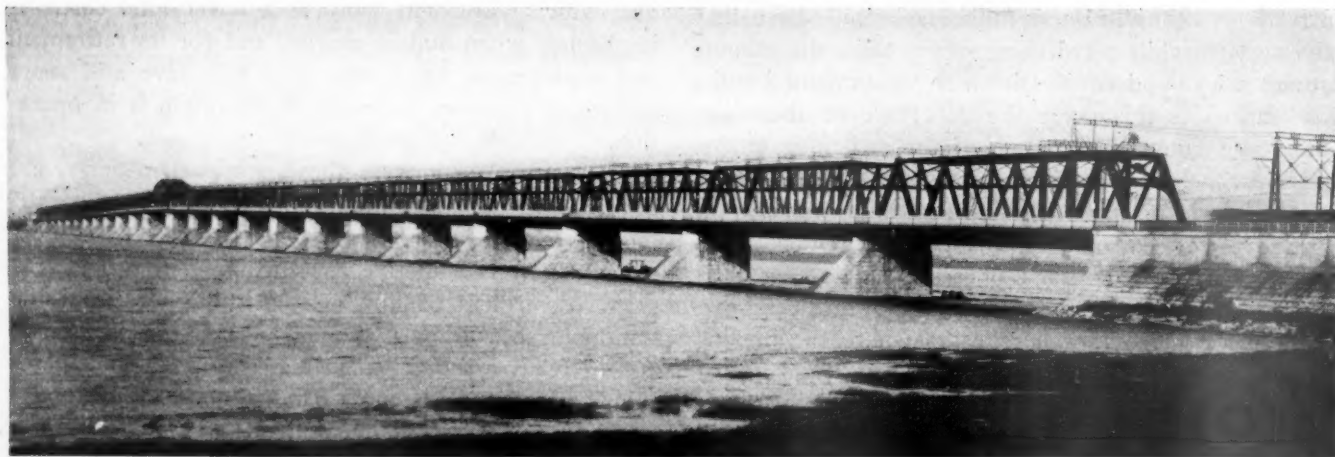
GRAHAM LYON, F.R.G.S.

There are, of course, as this well-wishing Briton does not apparently know, traffic offices of various individual American railways in European cities, where information regarding this continent is available. However, the fact that he, apparently an experienced traveler, is not aware of their existence seems to offer ample evidence that these facilities might profitably be extended. Co-operative effort by the railways, however, rather than the shouldering of the whole burden by the few lines which can afford to maintain individual offices, would seem to be the more effective method for building business of this kind.

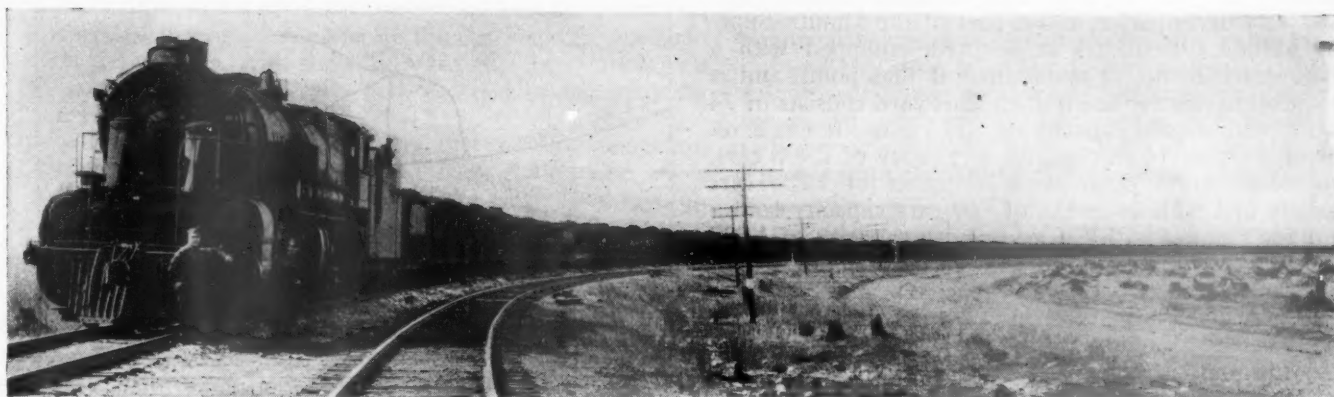
There is another hindrance to American travel by Europeans, however, which this correspondent does not mention but which must exercise a powerful and harmful influence; that is, the United States immigration regulations. These regulations, designed primarily to restrict wholesale immigration without great thought of the temporary visitor, have resulted in placing unnecessary and even ridiculous handicaps in the way of Europeans who wish merely to visit our shores. Without going into detail regarding these restrictions, it suffices to say that they appear from a casual examination to be sufficiently burdensome to discourage all but very hardy and determined travelers from attempting a visit to us.

A collective effort on the part of the railways and other interests which would profit from the development of travel in this country by Europeans could doubtless secure the removal of many of these restrictions and could, by imitating the work of European agencies established in this country, undoubtedly increase the number of our visitors from abroad. The idea which all too many of us hold that most Europeans are poverty-stricken and could not afford to travel even if better facilities were offered is plainly erroneous in view of their extensive journeyings to more hospitable lands.

\* \* \* \*



The Canadian National's Victoria Bridge, Across the St. Lawrence River at Montreal, Que.



A Loaded Ore Train About to Start Its Run to the Docks

# Handling Fourteen Thousand Ton Trains

*Great Northern moves large ore traffic to the head of the lakes speedily and safely*

**I**N moving the vast iron ore traffic from the Mesabi range in Minnesota to its ore docks at Allouez, Wis., the Great Northern averaged 13,353 gross tons per train during the season of 1929, while the revenue load averaged 10,269 tons per train for the same period. Furthermore, by placing these runs on a turn-around basis, the time per trip on the westbound empty movement has been reduced from 8 hr. 42 min., in 1920, to 5 hr. 27 min. in 1929, and the eastbound loaded movement from 8 hr. 4 min. to 6 hr. 37 min. per trip, the average round trip mileage being 214. That this tonnage was handled in safety is indicated by the fact that the Mesabi division, over which the ore moves, has consistently maintained the best record for safety of any division of the Great Northern for several years.

As an indication of the improvement that has been effected in operation, the train load averaged 7,195 tons per train, and the lading 5,363 tons in 1920. Since that time the gross tonnage per train has been increased 85.6 per cent, and the net loading 91.4 per cent. Likewise, the average number of cars per train has been increased from 110 in 1920 to 169 in 1929, while the average load per car is now 60.82 tons, as compared with 48.91 tons in 1920. The gross ton-miles per freight train hour were 84,385 in 1920, and 212,536 in 1929.

The year-by-year improvement in this connection is indicated in Table 1, which shows the operating statistics for 1929, as compared with the previous year. Several operating records were established in 1929. The heaviest train was run on June 30, with 146 large and 30 small ore cars, handling 16,724 net tons, of which 13,256 tons were ore cargo. The longest train was run on August 19, with 178 loaded cars, while the largest day's loading was on September 22, and amounted to 179,194 long tons. The record shipments of ore for one month were made in August, 1926, when 2,940,876 long tons were handled.

The Mesabi range is situated somewhat over a hundred miles west and slightly north of Duluth. It pro-

duces an enormous output of iron ore, of which the Great Northern handled 12,685,230 tons of 2,240 lb. in 1920, and 17,355,736 tons in 1929, which was the record year. The railroad is called upon not only to handle this ore in road haul, but must also provide facilities for assembling it from the various mines scattered throughout the range, and for trans-shipping it from cars to boats at the port. It is also necessary to provide an adequate yard for holding the large number of cars awaiting

Table 1—Ore Service Performance—Great Northern

		1929	1928
Average load per car:	Large car	63.03 GT	63.30 GT
	Small car	43.59 GT	44.02 GT
	All cars	54.30 GT	54.42 GT
Average load per boat		10 003 GT	9 746 GT
Time of boats:	Av. time at dock	5'45"	5'32"
	Per 1000 GT	35"	34"
	Av. time loading	3'18"	3'24"
	Per 1000 GT	20"	21"
Average number cars per train of ore		168.85	167.97
Av. time of trains on roads:	East	6'37"	7'10"
	West	5'27"	5'44"
	Both directions	6'02"	6'24"
	Round trip	12'04"	12'48"
Av. gross tonnage per train:	East	13353.88 NT	13323.88 NT
	West	3031.03 NT	2916.61 NT
	Both directions	8237.40 NT	8189.37 NT
Av. gross ton-miles per train hour:	East	212536 NT	195014 NT
	West	60589 NT	55697 NT
	Both directions	144605 NT	133982 NT

grading reports from the mines, before the ore can be dumped into the pockets on the ore dock in its proper classification.

The G. N. collects, loads and distributes empty cars out on the Range to and from 61 mine spurs. The concentration point for this traffic is at Kelly Lake, where a yard with a capacity of 1,464 cars is maintained. There are, in addition, several small feeder yards in the range territory, the largest being at Nashwauk, on the line between Kelly Lake and Gunn.

The ore port for the G. N. is at Allouez, Wis., a few



miles east of Superior, and a part of the Duluth-Superior harbor system. A large yard, equipped with a double-track hump, is maintained at that point, and is used exclusively for ore traffic. This yard consists of 74 tracks, with a total capacity of 5,773 cars. It has a receiving yard of 14 tracks with a capacity of 2,408 cars, two classification yards with 28 tracks of 1,285 cars capacity and with 24 tracks of 860 cars capacity, and a yard for empties with 8 tracks and a capacity of 1,220 cars. The yard is equipped with twin automatic scales, 24 ft. long, with two 125-ton-capacity beams.

The unusually large receiving yard is necessary to provide space for holding cars awaiting grading reports from the mines. After these reports are received, the cars are classified according to ore content. Two tracks are provided around the humps over which engines employed in pushing the cars up to the docks may operate into and out of the classification yard without undue interference with the humping operations. There is a rise of some 60 ft. in the half mile from the yard on to the docks, and the average cut pushed up for unloading is 28 cars.

There are four docks in all, the dimensions of which are shown in Table 2. Docks No. 1 and 2 are of steel and concrete, while Dock No. 3 is a wooden dock, and Dock No. 4 is of steel construction on a concrete foundation. All of the docks have been modernized within the last ten years by the installation of electric machinery throughout.

The labor on the dock is handled under contract with an outside firm. In 1920, the tons shipped per man per

Table 2—Great Northern Ore Docks

Dock No.	Number of Pockets	Cars per Pocket	Height to Deck	Width out-side	Pocket Cu. Ft.	Length of Dock	Length of Spout
No. 1	374	7	80'8"	56'	5620	2244'	36'
No. 2	350	7	80'6"	56'	5620	2100'	36'
No. 3	326	6	77'0"	59'8"	5100	1956'	34'
No. 4	302	6	75'0"	62'6"	5035	1812'	34'6"

day were 144, which figure was increased to 346 tons in 1929, brought about by the modernization of the facilities, the increase in the average size of the ore cars, and the use of air hammers instead of iron bars for loosening the ore prior to unloading.

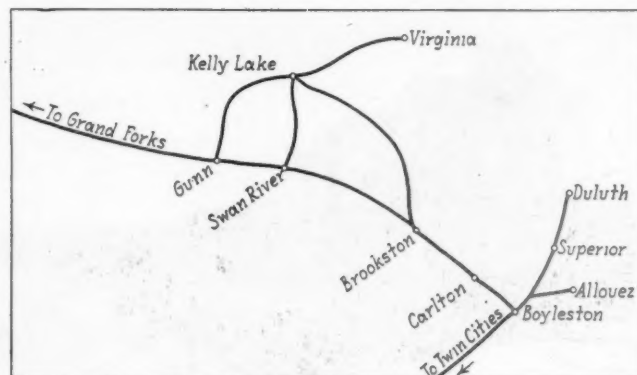
The average cargo, which was 10,127 tons per boat in 1920, was increased to 11,203 tons in 1929. The fastest boat dispatch occurred on July 3, 1929, when an average of 1,000 long tons was loaded per 10½ min. and the boat departed 2 hr. 15 min. after docking.

#### How the Ore Trains Operate

The ore moves only during the season of navigation on Lake Superior, a period of seven months annually. During this period, an average of about 10 trains, during peak movement, is operated in each direction daily between the port and the range. This represents a daily average movement of approximately 100,000 tons of ore.

The map shows the ore operations district. Trains of empty cars from Allouez yard proceed over the double-track main line as far as Swan River, 76.54 miles, protected by automatic block signals. From this point to Kelly Lake, 25.45 miles, these trains then operate over a single-track line, which, except for a daily way freight in each direction, is given over entirely to the movement of empty ore cars.

Two routes are used for the return movement with loads. Most of the trains operate from Kelly Lake to Brookston, 50.33 miles, over a single-track line, without a station or a telegraph operator for the entire distance, most of which is on a tangent. This line is used exclu-



How the G. N. Serves the Mesabi Range

sively for loaded ore movement, hence only by eastbound trains, and is closed for some months each season, after the ore traffic ceases to move. From Brookston to Allouez, 49.29 miles, the loaded trains follow the same route, in the reverse direction, as the empty trains.

The alternate route for loaded trains is from Kelly Lake to Gunn, 31.32 miles, over a single-track line, protected by an electric staff machine in the heavy switching territory between Calumet and Holman Junction, 4.39 miles, thence to Swan River, 16.46 miles, over single track. From Swan River to Allouez, 83.67 miles, these trains follow the same route, in the reverse direction, as the empty trains. The route via Gunn is used for trains picking up loads on the range west of Kelly Lake, and, as a result of its installation, it was possible to eliminate 10 transfer crews at Kelly Lake, which were formerly engaged in bringing this ore from the mines on the western half of the range to the concentration yard.

#### A Typical Run

These ore runs are made on a turn-around basis, whereby the train and engine crews that bring up a train of empties take back a train of loads immediately, thus being at their home terminal every night. This change in operations, which was begun in 1920, necessitated a great many changes in methods, but it has proved highly efficient. At Allouez, the crew boards the train as soon as they report, and leaves immediately, while at Kelly Lake, the engine crew gets off the incoming engine in the receiving yard, crosses over to the departure tracks, and boards an outgoing engine, which they couple to a train of loads. After setting and releasing the air, this crew is ready to go, the regulation air in-



One of the Mines in the Mesabi Range. Inset: Huge Steam Shovels Are Used for Loading



spection having been made by the car inspector, as soon as the caboose, with the train crew, has been uncoupled from the incoming train, and attached to the outgoing train of loads.

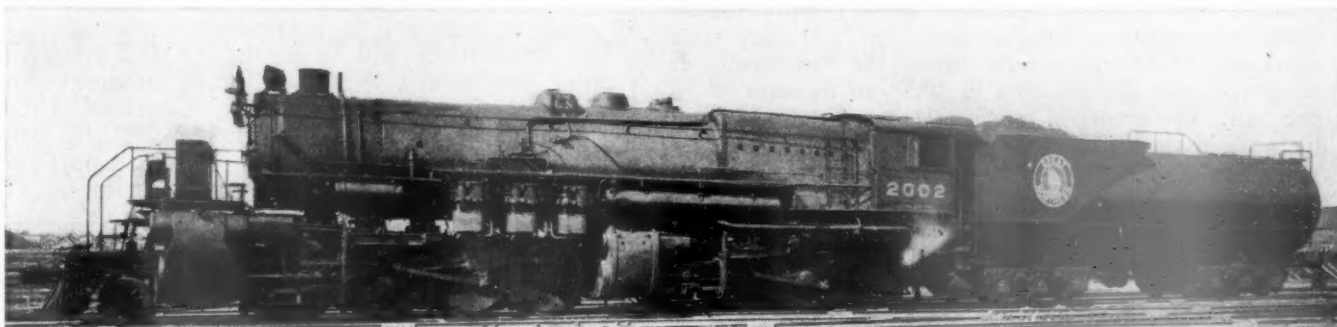
This is accomplished by having three enginemen on each shift at both Allouez and Kelly Lake, who serve as make-ready men. At Kelly Lake there is always an extra road locomotive, the incoming engine to be taken at once to the enginehouse, made ready for the return run, to leave as soon as the incoming crew of the next train of empties can transfer over to it.

A round trip made on July 25 will serve to illustrate the details of this operation. The train leaving Allouez consisted of 175 empty ore cars, and the tonnage, excluding the locomotive, the caboose and an office car, was 3,755 tons. The crew was called for 9:05 a. m. and the train left at 9:04, being aided by a locomotive pushing at the rear for a few hundred yards after starting. There is an ascending grade against the empty movement practically all the way, while the ruling grade eastward is 0.2 per cent. The single locomotive handled the empty train up grades as steep as 1.16 per cent without difficulty, and, at one time, attained a speed of 36 miles an

require careful dispatching, but the ore trains have the right-of-way over all other freight trains, and they are run at such times as to avoid passenger train interference. An adequate signal system, aided by power switches at numerous points, helps in avoiding delays. The ore trains are dispatched as extras, on straight running orders.

The reduction in the number of trains has also had a great effect in increasing the efficient capacity of the railroad. In the 1920 season, 2,580 ore trains were operated as compared with 1,853 trains in 1929. In other words, an increase of more than 36 per cent in tonnage was handled with 28 per cent fewer trains. When these figures are considered in conjunction with the reduction of 37 per cent in the average road time of trains of empties, and of 18 per cent on trains of loads, some idea of the increased capacity may be gained. As a result of these improved operations, it has been possible to take up nearly 20 passing tracks in this district.

Formerly, these trains made four or five water stops in each direction, but some years ago, the number of stops necessary for water was cut down by the addition of specially constructed steel water cars on each train.



The Type of Locomotive Used in Ore Service

hour. The only stop was at Brookston, 19 min., for coal, water and inspection, and the run of 109 miles was made in 5 hr. 9 min.

Upon arrival at Kelly Lake at 2:13 p. m., the transfer was made and the same crew left with a loaded train at 2:26 p. m. This train consisted of 167 loads, 15,030 tons.

Again, the only stop made was at Brookston, where 18 min. was consumed in inspection and taking coal and water. The loaded train arrived at Allouez yard at 7 p. m., the return trip having been made in 4 hr. 34 min. A speed limit of 25 miles an hour, with a five-mile tolerance, has been placed on loaded trains, and, in this instance, the train maintained a steady speed of between 22 and 28 miles for the entire 100 miles. Thus, the round trip of 209 miles was made in 9 hr. 34 min., including the turn-around time at Kelly Lake, and the two coal and water stops at Brookston.

#### Avoiding Stops

One of the prime essentials in an operation of this kind is the avoidance of stops. Apart from the out-of-pocket cost of starting and stopping trains of this length and tonnage, there is the danger of break-in-twos, and other delays.

One of the ways of avoiding stops is by keeping these trains off single track where there is traffic in the opposite direction. Thus, the Kelly Lake-Brookston line is solely for loaded ore movement, while the Kelly Lake-Swan River line is to all intents and purposes solely for empty movement, since it is an easy matter to keep the few eastbound trains out of the way.

The movements of these trains over the busy main line

This was an improvement, but it had the disadvantages of requiring the hauling of an additional non-paying load, and necessitating two spottings at the spout for each train at each water station. The provision of tenders with a water capacity of 21,500 gal. eliminated all of these difficulties, and has made it possible to operate these trains with only one water stop at Brookston in each direction. The proper operation of this stop is closely supervised, a trainmaster and a road foreman of engines being located at Brookston and working each way out of that point. These stops at Brookston averaged less than 20 min. duration during the 1929 season.

In a movement of this magnitude, it is necessary to avoid even the slightest hitch, which may, upon occasion, disturb the smoothness of the entire operation. Rather elaborate provisions are made to prevent hot-boxes, but experience has shown that these precautions are no more elaborate than is necessary. A force of 10 men is provided on each shift at Allouez, and 10 more at Kelly Lake, for the spooning and packing of journal boxes. No car leaves either terminal without a thorough preparation of the boxes. At Brookston, four car inspectors meet each train, the train being divided into sections for more rapid inspection, with two men taking each side. Because of the length of these trains, water barrels are set at frequent intervals along the entire standing track, enabling the inspectors to procure a water supply by walking only a few steps, instead of walking the length of the train, which, with these long trains, represents a considerable saving in time.

The crews on these trains are composed of experienced men. The ore runs are the preferential jobs on the divi-

sion, since they pay high wages and permit the men to be at home every night. A keen rivalry exists among the men as to performance. A monthly "batting average" is issued to the enginemen and conductors, and there is a long-standing rivalry for the honor of standing high on the list.

### The Equipment

The locomotives used in this service are Mallets. These were formerly compound engines, but, in 1926, they were converted into simple engines in the Great Northern shops, at a cost of \$27,000 each. This change has resulted in a saving in the operation of each locomotive of about \$100,000 in each ore season since that time. As a

Table 3—Locomotive Dimensions

Cylinders	4—25 by 32
Working steam pressure	210 lb.
Weight of engine	450,000 lb.
Weight of tender—loaded	365,400 lb.
Total weight—engine and tender	815,400 lb.
Coal capacity	24 tons
Water capacity	21,500 gal.
Heating surface of tubes	5,837 sq. ft.
Superheating surface	1,868 sq. ft.
Grate area	78.4 sq. ft.
Firebox length	117 1/4 in.
Firebox width	96 1/4 in.

result of the improved operation, greater utilization of these locomotives is being secured. In 1920, they were averaging 18,309 miles each during the ore season, as compared with 28,122 miles in 1929, an increase of 53 per cent. The principal measurements of these locomotives are given in Table 3.

By reason of the fast round trip movement, car shortages are now practically unheard of, although they were frequent some years ago. There are some 8,300 ore cars used in this service, of which about 3,800 are of 75-ton capacity, the remainder being 50-ton. The small cars are

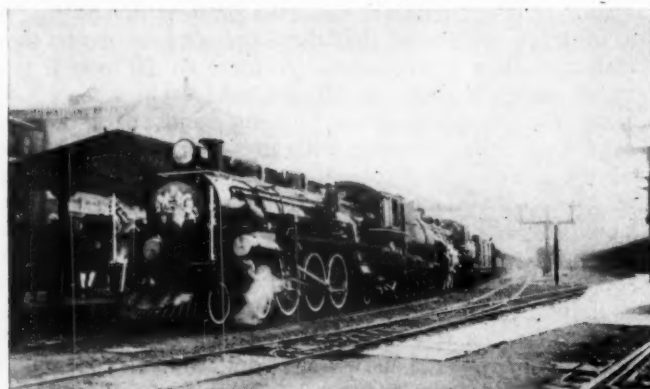
Table 4—G. N. Ore Cars

Small		Large
100,000	Capacity	150,000
31,700	Weight	41,300
620	Cubic capacity	1,080
20 ft. 3 3/4 in.	Length inside	19 ft. 10 in.
7 ft. 10 in.	Width inside	9 ft. 9 3/4 in.
9 ft. 10 in.	Height	10 ft. 2 in.

being replaced under a program which provides for the building of 300 new 75-ton cars annually at the Superior shops of the G. N., and the consequent retirement of 500 of the smaller cars. The comparative measurements of the two classes of cars are given in Table 4.

During the three to four months when this traffic is not moving, every car in this service is put over the repair track. Here it is given a thorough inspection, is dated and weighed, and such repairs are made as will insure its continued operation throughout the season, with only minor attention, if any.

\* \* \*



A Royal Train Ready to Leave Auckland, New Zealand Government Railways

## Larger Electric Locomotives for the N. Y., N. H. & H.

THE ten electric locomotives for the New York, New Haven & Hartford, the order for which was announced in the *Railway Age* of September 20, will be larger than any now in service on that road. They are being constructed at the Erie, Pa., works of the General Electric Company. The units, which will operate with either alternating or direct current, will handle main line passenger trains between New Haven, Conn., and New York City, including operation over the 600-volt, third-rail section of the New York Central Railroad, as well as into Grand Central Terminal or over the Hell Gate route to Pennsylvania Station.

The locomotives will have a one-hour rating of 3500 horsepower and will weigh approximately 200 tons completely equipped, with 135 tons on the driving axles. The capacity of each unit on level tangent track will be fifteen 80-ton cars at speeds up to 65 miles an hour in the alternating-current zone and up to 58 miles per hour in the direct-current zone. Maximum speeds of 70 miles an hour will be obtainable.

The locomotives will be of the 2-C-C-2 type with running gear similar to that of the 22 locomotives recently placed in service by the Cleveland Union Terminal Company. Each is equipped with six twin-armature, single-phase commutator-type motors designed for operation at 210 volts per armature. The twin armatures will be connected to the driving axles through spring-quill mechanisms.

### Running Gear and Cab

The running gear will consist of two 3-axle driving trucks, connected by an articulated joint with extensions at the outer ends supported on two 2-axle guiding trucks. The usual system of equalization is to be included to provide spring support for the entire locomotive, with the exception of wheels, axles and journal boxes.

The cab will be of the box type, divided by bulkheads into three compartments; an apparatus compartment in the center and an operating compartment at each end with an aisle running the entire length of the locomotive on either side of the apparatus compartment.

The transformer will be a single-phase, 25-cycle unit of the air-blast type, having a low-voltage winding provided with reduced capacity taps for the operation of compressors and blowers. Two two-stage air compressors will be used driven by alternating-direct current motors, with a piston displacement of 100 cubic feet per minute when operating at a pressure of 135 pounds per square inch. A high-speed circuit breaker connected in series with the traction motor circuit will protect the apparatus in case of overload or short circuit.

For heating the trailing passenger coaches an oil-fired steam boiler will be installed in one end of the locomotive, with suitable tanks provided for water and fuel oil.

It is expected that all the locomotives will be delivered to the railroad ready for service before the end of August, 1931.

The principal dimensions will be approximately as follows:

Length inside knuckles	77 ft. 0 in.
Length of cab	60 ft. 0 in.
Total wheel base	66 ft. 0 in.
Rigid wheel base	14 ft. 0 in.



# Railway Shop Men Review Supply Problems

*Workable plan of avoiding material shortages outlined—Cost of delays analyzed*



*On the Soo in Minnesota*

HOW to keep reducing the imposing quantities of materials which railway stores departments carry to meet the requirements of the locomotive and car forces and how to keep reducing, at the same time, the cost of delays to shop work chargeable to material shortages was one of the problems considered by the general car and locomotive shop foremen of the railways during the annual convention of the International General Foremen's Association in Chicago last week. The session on shop material, which was addressed by H. C. Stevens, general storekeeper of the Wabash, and which included a report on the cost of material delays by a committee led by F. M. A'Hearn, assistant general foreman of the Bessemer & Lake Erie, marked the fourth consecutive year in which the shop foremen of American and Canadian roads attacked the supply problem and called in supply leaders to counsel with them in bettering conditions.

While realizing that success in meeting the requirements of shops for materials must fall short of the ideal until the management can program operations with greater precision. Mr. Stevens insisted that the usual trouble between store and shop forces can largely be avoided by making better use of available knowledge and outlined a plan that has proved effective for this purpose. He also urged the unification of all material handled by the stores and shops under the direction of the stores department and spoke of the need of intelligent management of railway manufacturing.

The committee of the association, in a report on the cost of delays to shop work resulting from inefficient supply service, showed that losses are still being experienced as a result of delayed material. They not only involve increased cost of labor and material but carrying charges for idle investment in power and facilities, and also costs of accidents and untimely repairs resulting from substitute materials or make-shift repairs. The maintenance of up-to-date lists of repair parts is greatly needed in reducing mistakes which give rise to these losses, according to the committee, which also advocated that manufacturers should be called upon to provide such lists in connection with locomotive and car specialties.

## Remarks of Mr. Stevens

If it were possible for railroad management to determine its program of shop work three or four months in

advance, said Mr. Stevens, not only could appreciable reductions in shop time per engine and appreciable savings in repair costs be made, but shop losses from material shortages and stores losses resulting from keeping materials in stock too long could be avoided. Some materials would be bought in quantities beyond the immediate requirements in order to secure their economical purchase, but in these cases the saving in price should more than offset the carrying cost.

It has been demonstrated that by diligently using locomotive data regularly compiled for other purposes and by repeated checks and reports on the condition and requirements of individual locomotives before they reach the shop, an extensive improvement in supply conditions can be made. The practice of not ordering materials until after a locomotive reaches the shop results either in heavy material stocks to protect the work or extensive delays while the material is being purchased.

The chief mechanical officer of each Class I railroad prepares a report of locomotive conditions for the government each month. This report gives the estimated time that each locomotive will continue in service, the month in which it will probably be shopped, and the class of repairs likely to be required on the shopping date. A copy of this report should be furnished the shop and stores officers who handle the repairs. In addition, each engine should be inspected about 90 days before it is to be shopped. The inspection should be made by the master mechanic or other competent mechanical representative and a report should be prepared, preferably on a prescribed form, giving the anticipated requirements of such items as boiler fronts, cylinders, frame and deck castings, cylinder heads, firebox, tires, engine and trailer truck wheels, etc. A copy of this report should then be rechecked 60 days and 30 days before the shopping date and the local officers informed promptly of any changes that may have developed as to the probable work and material requirements. A minute inspection should finally be made after the engine is shopped and stripped, and the whole situation checked with the storekeeper.

By using this data intelligently, the storekeeper should be able to furnish the materials required. He should know, for example, that some locomotive parts such as journal bearings, main rod bearings, side rod bushings,



packing, stoker distributor tubes, etc., must be renewed at each shopping, and he can provide for these by knowing what the shopping date will be. He should also study carefully the mechanical appliances or specialties on the locomotive to be shopped, such as boosters, injectors, lubricators and feedwater heaters, so that he can reasonably meet the demand for these. The remaining items, such as bolts, nuts, pipe and fittings, iron, rivets, etc., can be provided on the basis of past consumption and the general shop program. Railroads that are not using a method similar to that outlined should give it a fair trial, because it will return a handsome profit on the effort expended.

#### Consolidate the Delivery Work

There are still places where the shop and the stores are each trying to handle materials separately. The result is duplication of equipment and excessive empty movement. The work should be under one directing head at each point. Whether it is under shop or store direction is not so important. However, it would seem that the storekeeper should generally be responsible for the work. The shop officer is primarily interested in shop output and constantly occupied with the mechanical work, while the storekeeper is occupied equally with the procurement of material and its handling, and with proper support he should be able to serve the shops satisfactorily and at the lowest cost. Where stores forces deliver the materials, moreover, failures are generally reported promptly and correctly, whereas under the old method, slow or improper deliveries were seldom reported unless they were discovered while investigating delays to work.

#### Railway Manufacturing

Frequently, no definite method is used in determining the quantity of materials to be manufactured or finished in the shops for store stock. Such items should be checked at regular intervals and the orders placed on the shops with the same care and precision that would be employed if they were to be purchased from a manufacturer. The quantity to be made at any one time should be governed by (1) the known or estimated unit value; (2) the cost of setting up the machinery to do the par-

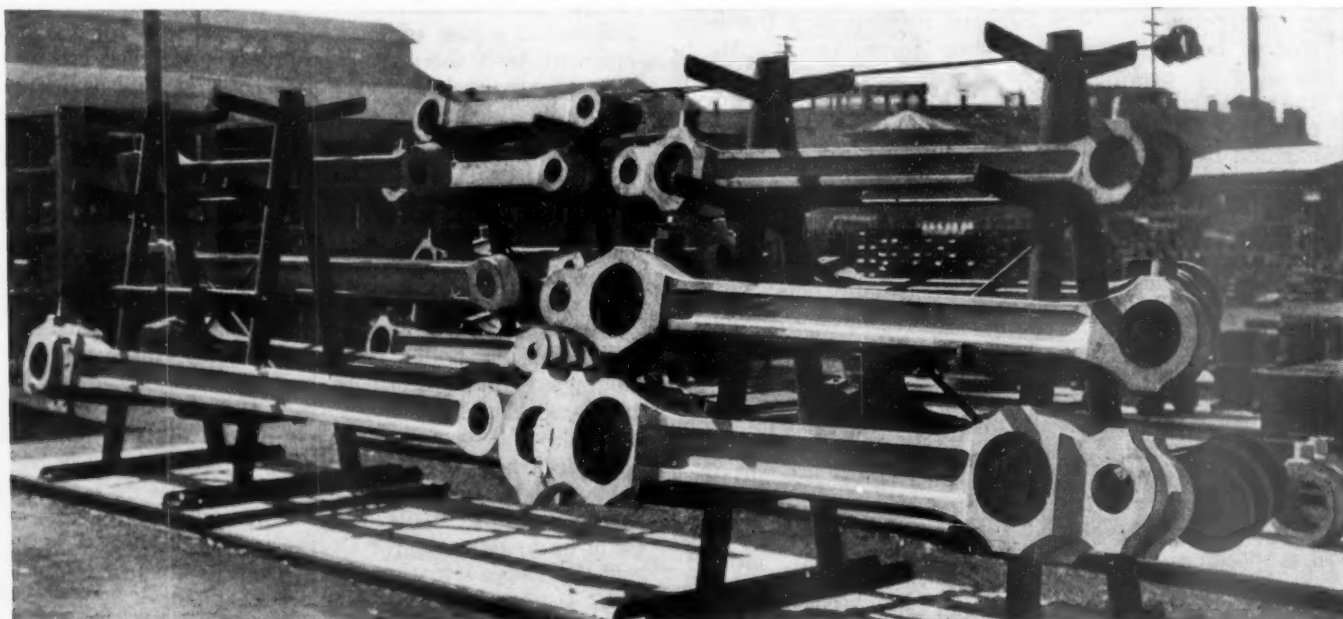
ticular job and to dismantle it after completing the work; (3) one month's consumption; (4) the additional carrying charges for material manufactured beyond current requirements; (5) the quantity which it is possible for a machine to produce in the period to which it is practicable to allot the machine to the particular job. There are times in the past and, no doubt they continue in some shops, when machines have been set up several times in a month to finish small quantities of castings or to do other manufacturing in small quantities where the cost of producing a much larger quantity would have been little, if any, greater.

Shop losses and store stock losses mean much the same thing. In so far as material is concerned, one does not occur without the other.

#### Report of the Committee

The costs resulting from the inability to deliver a locomotive or car to the transportation department on scheduled time and the increased labor costs incidental to the delay are the most prominent but not all of the costs incident to delayed material, said the committee of shop men in their report. The investment in the unit itself, together with allowance for obsolescence, should be considered; also the value of shop space together with the overhead of all departments concerned in providing and applying equipment materials. Added to these are the cost of transferring materials where substitution is required, the loss of time moving men from job to job while awaiting material, the cost of replacements between shoppings resulting where materials are used beyond their normal service life, and the failure of parts used beyond their normal service life.

The investment to be considered will vary with the value of the unit in question, but, considering that interest at 6 per cent on a locomotive valued at \$100,000 amounts to \$6,000 per year, or \$500 per month, it is evident that every delay in repairing power should be considered. By considering the investment in shop buildings and equipment, together with their depreciation and maintenance, it is possible to establish a rental value for the space occupied by each unit undergoing repairs, to which a figure for supervision, light, heat, power and the



An Orderly Stock of Locomotive Parts on the Southern Pacific

attendant costs of other departments whose activities enter into the furnishing of equipment materials may also be added in studying the cost of any time needlessly spent in the shop.

Replacement costs, between shoppings, of items which could have been replaced at much lower cost while the unit was undergoing extensive repairs, are rather obscure, but exist nevertheless, while service failures and accidents due to the use of parts which should have been replaced at overhauling periods add further to the cost of material delays, although they are not apparent at the time the material is actually wanted. Too zealous an attitude in reclamation will in many cases add materially to the ultimate cost of material delays. In other words, it is possible to carry reclamation to the point where an apparent saving becomes an acute waste.

Delays to shop work chargeable to material are caused by:

- Lack of sufficient advance notice by the purchases and stores departments regarding their repair programs
- Insufficient or inaccurate information at the time of placing orders
- Insufficient stocks
- Disinterested attitudes between departments
- Wrong shop layouts or lack of suitable facilities for handling materials

Inaccurate information concerning the requirements of material is a cause of delays that arises at the most inopportune time and results principally from the use of obsolete repair part lists or the lack of accurate detailed information at the time of placing requisitions. Conditions will also be improved by the stores departments' keeping the users of the materials informed of the arrival of the materials ordered.

#### The Manufacturers Can Help

The practice of securing from manufacturers of auxiliary equipment their recommended practices concerning the renewal of the equipment is advocated as a means of avoiding delays. The recommendations should cover the limits of wear, the use of over-sized materials, and the combining of renewable parts with parts not requiring renewals. Many manufacturers provide such lists; others, upon application, will furnish gages and templates for restoring the contours of worn parts. Others furnish tools for restoring contours of worn surfaces.

Lists showing the approximate amounts of parts required in the maintenance of auxiliary devices should also be obtained. While the shop men may be more or less reluctant in asking the manufacturer what parts will require renewal first or what percentage of renewals in a given period of time will be required, it is a fact that mechanical devices are subject to wear, regardless of the cause, and in the interests of economy the manufacturer can frequently furnish accurate information as to the probable renewals and thus save the user from guessing and perhaps overestimating the requirements.

#### Shop Meetings Prevent Delays

On the Boston & Maine, it was brought out in the discussion, delays to shop work resulting from a shortage of material are effectively controlled by holding a meeting of shop supervisors every morning, at which a special inquiry of important materials for power is made and a list of these items prepared for the attention of the shop supervisors and the stores. The power, moreover, is not brought into the shop until the important items needed for it have been received.

On the Missouri-Kansas-Texas, requirements are anticipated by inspecting and reporting on the power 90 and 30 days before it reaches the shop and by having each

foreman inspect the power after it has been stripped in the shop. The storekeeper is given a copy of these reports. It is also a standard practice on the Katy for the mechanical engineer's office to prepare a permanent schedule governing the scrapping of locomotive parts so that nothing will be discarded unless justified under this schedule.

#### Watch the Small Items

The value of the small items, said W. J. McCloskey (I. C.) is not comparable to the value of the large items of repairs, but frequently the shortage of the small items causes expense and trouble of real consequence to the shop. This is particularly true, added F. M. A'Hearn (B. & L. E.) in connection with the non-transferable items, such as superheater parts and special castings and fittings where the shop men cannot use a substitute and is put to the necessity of robbing serviceable power. On the Illinois Central, meetings are held once a week, at which a representative of the stores department is invariably present for the purpose of discussing the material situation and investigating shortages of material.

C. H. Murrin, stores accountant of the Illinois Central, called attention to the fact that about 35 per cent of the \$472,000,000 tied up in unapplied material on the railroads at the close of 1929 represented supplies for the maintenance of equipment. On the Norfolk & Western a record is kept of delays to shop work chargeable to stores and to each gang. The stores are given 30 days' notice of the major material requirements and, when the power reaches the shop, the movement of each locomotive is scheduled on a time basis and the stores department and the various shop gangs are required to explain any delays fairly chargeable to each on account of material shortages or the failure of the locomotive to move on schedule.

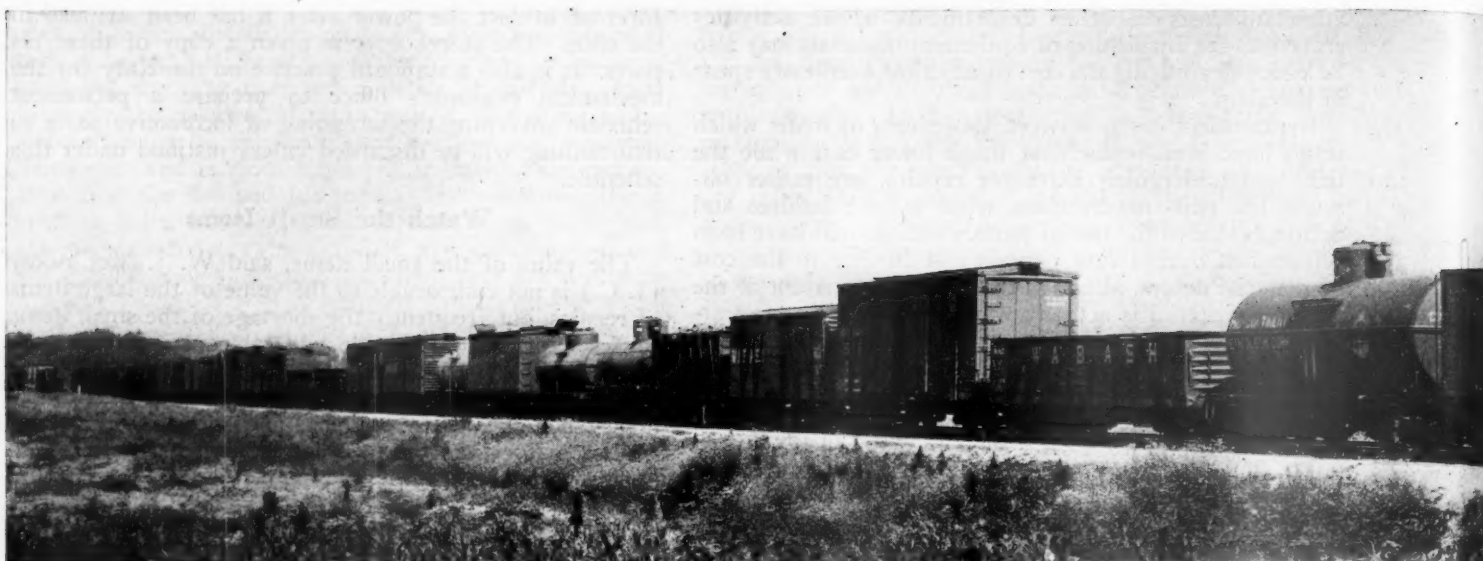
J. B. Dunlop (C.N.) called attention to the fact that the present problem is not so much one of avoiding delays to equipment undergoing general overhauling as in avoiding delays to the current repairs in the roundhouse. The time involved in making running repairs is considerable and a great amount of material is required. The supply problem is complicated by reason of the inability to estimate the requirements in advance. Under present conditions, the interests of both stores and mechanical departments can be furthered in a substantial way by the close study of the work reports.

\* \* \*



Pennsylvania and Hudson & Manhattan Trains at Journal Square, Jersey City, N. J.





One of the Wabash Class M-1 Locomotives in Through Freight Service

# New Wabash Locomotives Make Good in Service Tests

*Demonstrate about 22 per cent increase in capacity and fuel economy as compared with locomotives replaced*

**E**ARLY this year, the Wabash received from the Baldwin Locomotive Works, 25 Mountain-type locomotives, designed to develop high sustained tractive force for handling fast freight trains on the 272-mile line between Decatur, Ill., and Montpelier, Ohio. These locomotives,\* known on the Wabash as the Class M-1, develop slightly over 66,000 lb. tractive force with 235 lb. steam pressure, 27-in. by 32-in. cylinders and 70-in. drivers, and are provided with the latest economy-increasing devices, including feedwater heaters. They replace Class K, Mikado-type locomotives of similar cylinder size and initial tractive force, but having lower steam pressures and no feedwater heater equipment.

In regular freight train service during May and June, the M-1 locomotives demonstrated a capacity to handle 22.6 per cent more ton-miles per train-hour than Class K locomotives. In comparative road-service tests, using a dynamometer car, fuel consumption, expressed in lb. of coal per drawbar hp.-hr., decreased as much as 22.7 per cent, of which 10 to 12 per cent can be credited to the feedwater heaters and still leave a substantial margin chargeable to the improved modern design and proportioning of the locomotive itself.

The principal difference between the Class M-1 and the three series of Class K locomotives replaced are set forth in a table of comparative dimensions which, in addition to showing the larger driving-wheel diameter and higher steam pressure of the new locomotive, indicates the increased weight on drivers, larger grate area, proportionally greater evaporating and superheat-

ing surface and larger tender tank capacity. The smaller piston-valve diameter is noteworthy in a locomotive of increased power. While none of the Class K locomotives

Comparative Dimensions of the New Mountain-Type (M-1) and Mikado (K) Locomotives on the Wabash

Type	M-1	K-1	K-2	K-4-b
Cylinder dia. and stroke, in.	27 by 32	25½ by 30	26 by 30	27 by 32
Piston-valve dia., in.	12	14	14	14
Weight on drivers, lb.	270,400	207,140	220,000	257,660
Total engine weight, lb.	406,400	266,840	292,000	346,480*
Driving-wheel diameter, in.	70	64	64	64
Steam pressure, lb.	235	195	200	210
Grate area, sq. ft.	84.2	63	66.7	70.2
Evap. heating surface, sq. ft.	4,620	3,310	3,777	4,288
Superheating surface, sq. ft.	2,004	740	882	1,051
Max. rated tractive force, lb.	66,568	50,521	53,868	65,063**
Factor of adhesion	4.07	4.1	4.08	3.96
Tender capacity				
Coal, tons	18	13	16	18
Water, gal.	15,000		10,000	10,000

\* With trailer booster and syphons.

\*\* Including booster, 76,899 lb.

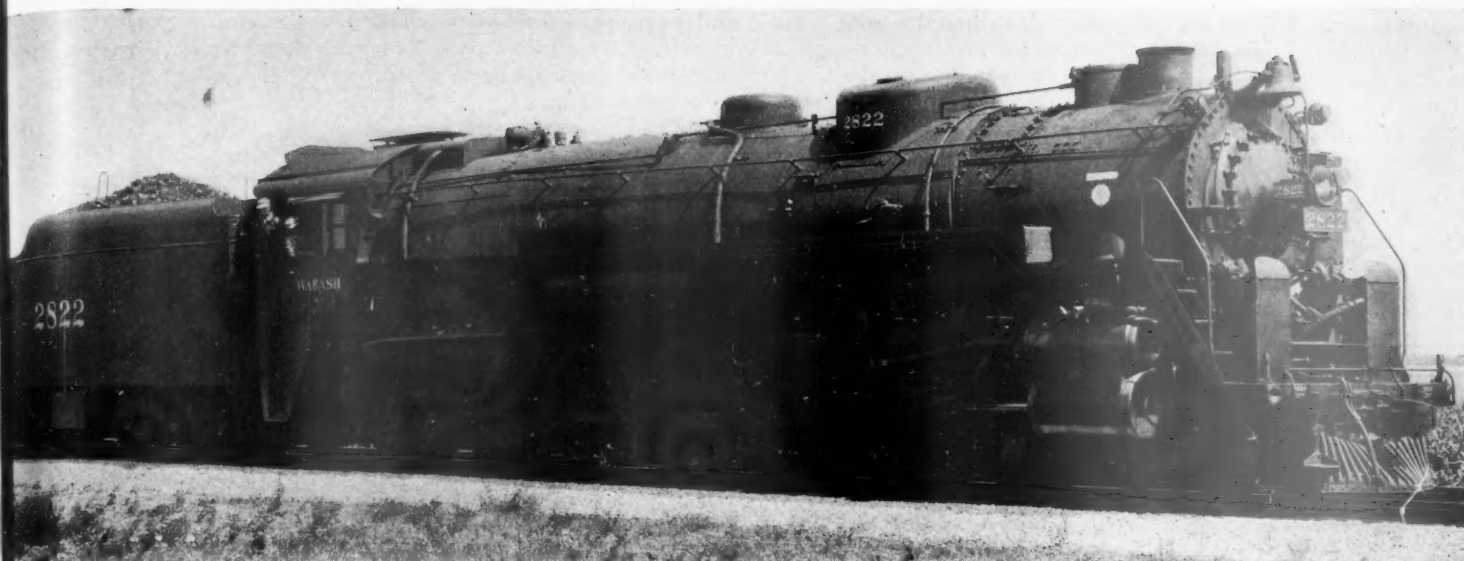
used on this district are equipped with feedwater heaters, the K-4-b class have boosters which gives them a substantially greater tractive force for starting and at slow speeds. The reduced tractive force of the K-1 and K-2 class locomotives is occasioned by lower steam pressure and slightly smaller cylinders.

## Ton-Mile per Train-Hour Performance

The new locomotives were tested from a capacity standpoint in regular fast-freight train service between Decatur, Ill., and Tilton, and between Tilton and Peru, Ind., the ruling grade on this portion of the line being 0.6 per cent eastbound and 1.0 per cent westbound. As shown in another of the tables, the percentage increase in 100 ton-miles per train-hour of the M-1 over

\* For a description of these locomotives, see the *Railway Age* for April 5, 1930, page 821.





the K-4 class locomotives was 26.0 and 27.7 per cent eastbound, Decatur to Tilton to Peru, and 18.6 and 16.7 per cent westbound, Peru to Tilton to Decatur. The average increase for the entire ninth district was 20.5 per cent; for the second district, 23.5 per cent; and for the combined districts, 22.6 per cent.

These figures are particularly gratifying to the Wabash management because they show that while the new Mountain-type locomotive has a tractive force only slightly greater than that of some of the earlier Mikados, it presents a marked advantage in capacity, as measured in ton-miles per train-hour, and hence is potentially a much more valuable revenue-earning unit of motive power.

The primary objects of the dynamometer car tests were to determine the coal and water performance of the new locomotive boiler and cylinders, as compared with that of the replaced locomotives, and develop what, if any, changes could be made to improve this performance. For example, some question was raised about

#### Comparative Locomotive Performance in Regular Freight Service for May and June

District	100 ton-miles per train-hour	Per cent increase
	M-1	M-1 over K-4
Decatur to Tilton .....	744	26.0
Tilton to Decatur .....	567	16.7
Tilton to Peru .....	552	27.7
Peru to Tilton .....	458	18.6
Total 9th district .....	657	20.5
Total 2nd district .....	509	23.5
Total .....	563	22.6

the ability of the Hulson Tuyere-type grates in the new locomotive to furnish sufficient air to the firebox as compared with the standard Hulson grates. There was also some question as to the most economical type of exhaust tip; the 6½-in. hook, the 6¾-in. hook and the 6¾-in. open tip being used during the tests.

#### How the Dynamometer Car Tests Were Made

The dynamometer car tests were made with Locomotive 2800 in regular fast freight service between Decatur and Peru. The tender on the locomotive was calibrated and a curve drawn to show the number of gallons of water at any height in the tank, an accurate record being kept of the water used during each test. All coal burned was weighed by means of a can of about 11 cu. ft. capacity with a drop bottom which was suspended above the stoker trough from a Fairbanks crane scale. Indicator cards were taken at 10-min. intervals to check the valve setting, back pressure, and the valve and cylinder performance. A pyrometer was

used to obtain the temperature of the superheated steam at the cylinders. Thermometers were placed in the tender end sill near the tank valve, in the branch pipe between the feedwater heater and the boiler check, and readings were taken at 10-min. intervals at the branch pipe and occasionally at the sill to obtain the work done by the feedwater heater. Headings such as the boiler pressure, steam-chest pressure, exhaust pressure, draft in front and back of the diaphragm plate and flue-gas temperatures were taken at 10-min. intervals. Draft readings over and under the arch were taken occasionally.

#### Average Results of Dynamometer Car Tests of M-1 Type Locomotive No. 2800 Using Different Grate and Exhaust-Tip Combinations

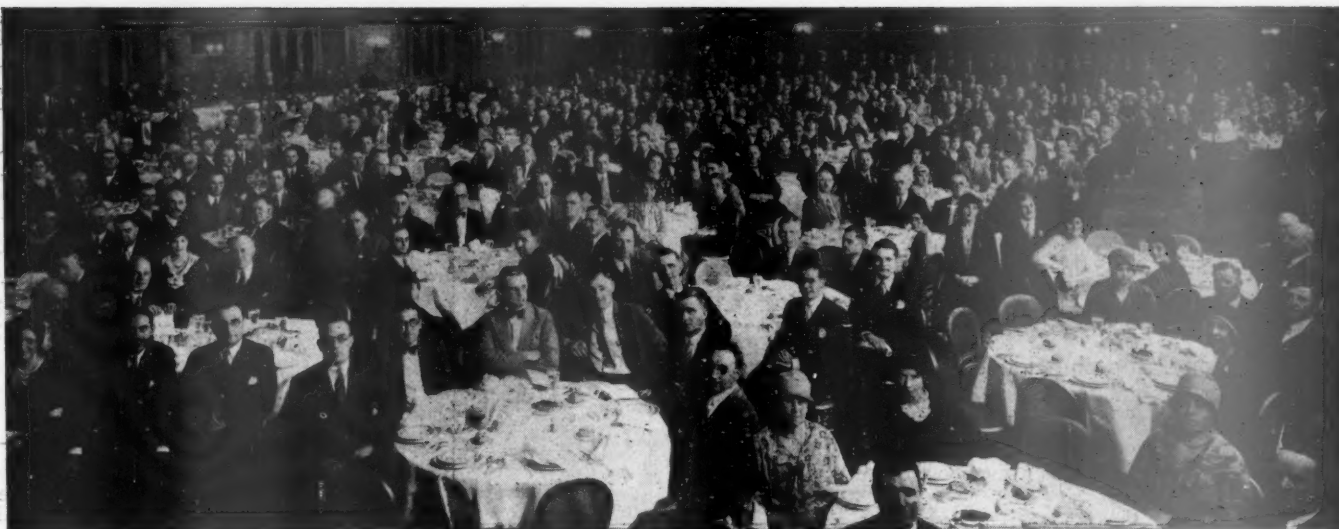
	Tuyere type	Standard type	6½-in. hook tip	6¾-in. hook tip	6¾-in. open tip
Number of cars .....	111.2	97.1	114.7	99.2	94.0
Tons, actual .....	3119.2	2896.3	3330.0	2853.6	2798.5
Tons, adjusted .....	3732.5	3434.7	3979.3	3391.6	3321.0
Boiler pressure, lb. ....	226.5	222.2	226.7	223.7	220.3
Exhaust, back pressure, lb. ....	16.3	10.0	17.1	11.9	7.1
Draft, front of diaphragm, in. ....	7.1	7.4	7.2	7.2	7.5
Draft, back of diaphragm, in. ....	5.4	5.2	5.5	5.1	5.4
Heated water to boiler, deg. F. ....	202.8	204.1	203.0	205.0	200.9
Steam temperature, deg. F. ....	597.8	618.0	598.6	608.9	629.4
Flue-gas temperature, deg. F. ....	482.3	480.7	482.3	477.3	485.8
Speed m.p.h. using steam ....	22.4	23.9	21.8	23.2	26.0
Speed m.p.h. on road .....	16.56	16.35	16.06	16.02	18.28
Drawbar pull, lb. ....	25,188	25,650	26,282	25,400	24,950
Drawbar horsepower .....	1511.0	1640.5	1512.2	1580.6	1724.5
Drawbar horsepower-hours ..	10,955	11,055	11,441	10,845	11,043
Coal fired per sq. ft. grate per hr. in motion .....	73.6	76.8	74.9	74.4	79.7
Water evaporated per sq. ft. heating surface per hr. in motion .....	8.46	9.07	8.45	8.69	9.82
Water evaporated per lb. of coal as fired .....	6.00	5.92	5.88	5.94	6.11
Equivalent evaporated from and at 212 deg. F. ....	7,125.2	7,088.2	6,960.5	7,085.5	7,360.4
Efficiency of boiler .....	63.51	63.28	62.25	63.14	65.79
Efficiency of boiler and heater ..	70.72	70.62	69.27	70.56	73.14
Coal per 100 ton-miles, lb. ....	9.66	10.51	9.54	10.44	10.52
Coal per drawbar horsepower hour, lb. ....	4.31	4.30	4.38	4.35	4.12
Tank water per drawbar horsepower hour, lb. ....	24.79	24.6	24.8	24.6	24.6
Tank water plus condensate per drawbar hp. hr. ....	27.9	27.9	27.9	28.0	27.9

The position of the throttle lever and of the reverse lever were noted, when changed. The Wabash dynamometer car, located between the tender and the first car, provided a record of drawbar pull, train speed and other test data.

During the first tests the engine did not burn a very bright fire, and there was more black smoke than desired. It was thought that admitting more air over the fire, by removing smoke suppressors (which gave a net air opening through the suppressor tubes of about 24 sq. in.) might help to clear up the smoke. This change made







More Than 500 Persons Attended the Annual Dinner

## Roadmasters' Hold 48th Convention

*Changes in organization as affected by use of power tools was most actively discussed subject*

THE convention of the Roadmasters' and Maintenance of Way Association that was held at Hotel Stevens, Chicago, on September 16-18, was well attended. The registration for the three days embraced the names of 250 members and other railway officers. In addition, some of the sessions were attended by others, including members of four committees of the American Railway Engineering Association which had scheduled concurrent meetings in Chicago. Of these, the Committee on Track has followed this practice for several years, having found much of profit in an arrangement which makes for a closer contact with the Roadmasters' Association and affords an opportunity for a study of the exhibit presented by the Track Supply Association.

The committee reports measured up to the high standard that has been set by the work of the association's committees in recent years and the subjects and manner of their treatment reflected a forward-looking attitude with respect to current problems. Three of the reports had to do with problems of organization, namely, those of the committees on The Equation of Track Mileage as a Basis for the Distribution of Forces; Getting the Most from Labor-Saving Equipment, and the Division of Work Between Section and Extra Gangs. In the presentation of all three of these reports or in their discussion references were made to the new form of track organization being developed on the Great Northern and the Chicago, Milwaukee, St. Paul & Pacific, and while such references as were made to these practices by the committees assumed a rather sympathetic attitude, discussion from the floor was of a tone that indicated decided conservatism on the part of those in attendance with respect to any plans for marked deviations from prevailing forms of organization. It was patent that the roadmasters look upon the section gang as the foundation for maintenance of way work.

The application of power equipment to maintenance

of way work was approached from an entirely different angle at this convention, in the form of a report of a Committee on The Use of Motor Trucks in Track Work, which embraced much information indicating the opportunity for economies through the use of highway vehicles and the consequent reduction in work-train service. An instructive report was also presented on recent developments in roadbed drainage.

The election of officers resulted in the advancement of the first vice-president, Elmer T. Howson, Western editor, *Railway Age*, to president, and of the second vice-president, C. W. Baldrige, assistant engineer, Atchison, Topeka & Santa Fe, Chicago, to first vice-president, and the election of J. J. Desmond, division engineer, Illinois Central, Chicago, as second vice-president. T. F. Donahoe, general supervisor, Baltimore & Ohio, and James Sweeney, supervisor, Chicago & Eastern Illinois, were re-elected secretary and treasurer, respectively.

### Five Papers Were Presented

In addition to the five committee reports, papers were read on five subjects of specific interest to the maintenance of way officer. These included: Track Maintenance as Affected by Signal Operation, by R. A. Sheets, assistant signal engineer, Chicago & North Western, Chicago; Looking Ahead in Maintenance of Way, by Lem Adams, general supervisor maintenance of way, Union Pacific System, Omaha, Neb.; The Method and Organization for Laying Rail on the Pennsylvania, by R. W. E. Bowler, division engineer, Pennsylvania, Pittsburgh, Pa.; Safety in Maintenance, by J. E. Long, superintendent of safety, Delaware & Hudson, Albany, N. Y.; and European Track Construction and Maintenance, by J. V. Neubert, chief engineer maintenance of way, New York Central, New York.

President Earl E. Crowley, roadmaster, Delaware & Hudson, Oneonta, N. Y., presided over the five sessions

of the convention, which was opened on Tuesday morning, September 16, with an address by L. C. Fritch, vice-president, operation, Chicago, Rock Island & Pacific. The joint report of Secretary T. F. Donahoe, general supervisor, Baltimore & Ohio, Pittsburgh, Pa., and Treasurer James Sweeney, supervisor, Chicago & Eastern Illinois, Danville, Ill., showed that the receipts during the year exceeded the expenditures by \$715, bringing the association's total assets to \$5,904. The membership record showed a total membership of 943 as compared with 866 in September, 1929.

### Safety in Maintenance of Way

J. E. Long, superintendent of safety, Delaware & Hudson, presented an outline of the safety movement, drawing extensively from practices of the Delaware & Hudson and reviewing some of the results obtained. He called particular attention to the work of safety committees, stating that in 1929 these committees reported over 161,000 corrections, of which 71,000 related to conditions and almost 90,000 to practices. "A correction a day will keep accidents away," he said, "is the slogan on the Delaware & Hudson. We have classes of instruction in first aid to the injured. We find that when a man realizes the possible results of an accident, he is more careful to do everything within reason not to have that accident happen. In addition, each track foreman who qualifies is given a compact but complete first aid kit for use when necessary. Practically every track and bridge and building foreman on our railroad is qualified to render first aid to the injured.

"Safety certificates are awarded to foremen for having no reportable injuries to the men under their supervision for periods of from one year to twenty years. In 1924, the last year prior to the organization of these committees, we had 7 maintenance men killed and 253 injured, (I. C. C.) or 34 casualties per million man hours worked. Last year, 1929, we had 11.3 casualties per million man hours worked, a reduction of approximately 70 per cent.

"An accident record, whether that record is good or bad, is the record of the men who make it and the credit for this performance is due to the supervising officers and employees who made it. It is their record and to them belongs the credit."

### The Roadmaster and the Future of the Railways

By L. C. Fritch

Vice-President, Operation, Chicago, Rock Island & Pacific, Chicago

[Mr. Fritch, who presented the address of welcome at the opening of the convention on Tuesday morning, drew a graphic picture of the problems that now confront the railways and pointed to the place occupied by the officer of track maintenance in this picture. His portrayal of the situation was founded in part on the F. J. Lisman's "Diagnosis of Railway Ills," published in the *Railway Age* of August 16, from which he quoted. An abstract of Mr. Fritch's address follows:]

I cannot stress with too much emphasis the importance and splendid results that come from associations such as yours in the advancement of the railways. Railroading is now a science, particularly the construction, maintenance and operation of railways and one of the greatest factors in establishing the science in railway operation have been associations such as yours. Such meetings bring out the best there is in men. Subjects are discussed and worn out theories are discarded for tried experiments. It is unfortunate that the railways do not fully avail themselves of the splendid work done by such associations. After expending great efforts to establish standard practices and methods they could be used more

generally than they are with great benefits to the railways.

With the speeds required on modern railways, and we are in a speed age, it requires the very best to meet the demands of the times. With airplanes making 150 m.p.h., railway speeds of 60 to 70 m.p.h. are slow in comparison. Who knows but that the future will find the railways equipped with heavy roadbeds, larger and heavier ties, rails of 150 lb. or more per yd. and locomotives propelled by electricity, making speeds of 100 to 125 m.p.h. Such things are not impossible and may be required to meet the ever-increasing demands of a fierce and increasing competition.

America was built up by the railways and owes its progress and success more to railway transportation than any other single factor. We, who have had a part in it and have in a way helped to bring it up to its present high standard, feel a pride in it and we should strongly resent any influence that tends to tear it down or cause it to deteriorate or go backward.

The question therefore, "What is the Future of the Railways?" is a very vital one—to every railway employee.

### Have We Passed the Peak?

Many able railway men think that the railways have passed the peak in their operation and owing to the various social, economic and political forces at work, will go backward in the future, unless a determined effort is made to combat honorably the influences that are at work depriving them of their well-earned birthright. The railroad business today is being conducted upon the highest plane of any industry in this country. I say highest advisedly. It has nothing to hide in the manner in which the business is conducted. Railway men are among the best and most respected citizens of our land. Certainly they are entitled to at least a square deal.

I am a believer in preparedness and feel that the railroads are threatened with a real menace, which will deprive them of something they have earned through long years of work and the expenditure of vast sums of money and the employment of millions of men, and that they should prepare to meet this situation in a determined honorable manner to preserve our industry. That the American public is not familiar with all the facts that menace the railways is apparent, and I think it is your duty and that of every railway employee to inform them as rapidly as we can.

I will cite one instance: The thousands of trucks that are taking away an ever-increasing part of short haul railway freight from the railways are hauling the goods that you and I buy of the merchant with railroad money. Why should we not say to the merchant with whom we trade: We get our money from the railroad and in all fairness we should not buy your goods if you haul it in by trucks, because by so doing, we are destroying our own industry." If this were generally done, thousands of "fly-by-night" trucks would go out of business.

[At this point Mr. Fritch summarized the salient features of Mr. Lisman's article.]

This writer points out some very pertinent reasons why the railroad industry is suffering, but I wish to call attention to one of the elements of strength he sets forth—the element of strength in operating efficiency, in both maintenance of way and equipment and in conducting transportation. The men here represented have a direct part in this and are to be congratulated upon the splendid results effected in the reduction of maintenance of way costs.

One of the great menaces to the railroads is the development of waterways. Anyone familiar with this subject, or who will take the time to investigate it, will find that there are numerous examples in the country today of money expended for waterways that have been uneconomical and will continue to be so. The railroads have the right to protect themselves against the menace of this encroachment upon their legitimate traffic. If every waterway project were analyzed, very little, if any, money would be expended on such a wasteful enterprise.

These forms of competition are most unfair and in the end the American people will not stand for them. It is your duty as railway employees to protect the interest which gives you your living; counsel with the public and tell the true story with respect to the influences which threaten the railroads, and in which the public is just as much interested as you are. I am satisfied that if the American public learns the true story, and knows of the attacks which are being made upon the railroads, the sentiment will be in favor of the railroads.

### Equating Track Mileage

After studying the practices of various railways with respect to the equating of track mileage as a means



of distributing forces, the committee assigned to this subject reached the conclusion that no single system of equated mileage is applicable to all roads. Some of the reasons for this position will be found in the following abstract of the report, which was presented by the chairman, P. J. McAndrews, roadmaster, Chicago & North Western, Sterling, Ill.

Very rapid changes in methods of track maintenance, brought about principally through the development and adoption of labor-saving machinery in track maintenance work, constitute a potent basis for the statement that any equation of mileage arrived at under the conditions that prevailed ten or more years ago would be of little value today, and, looking to the future, it appears reasonable to assume that ten years hence the track maintenance men of America will be doing their work in ways greatly different from the practices of 1930.

A most important factor in any plan for the equating of sections and the distribution of forces on the basis of the equation is some satisfactory system of cost accounting through which the maintenance officer will be fully informed as to the man-hour costs of different phases of the work. This association should continue studies in cost accounting, this being especially desirable by reason of the adoption of expensive labor-saving machinery and improved materials and appliances.

Through questionnaires submitted to the officers of a number of railways, information has been secured indicating the satisfactory use of mileage equations on several roads. An analysis of these replies confirms our belief that where the physical condition of a property is fairly uniform and the standard of maintenance high, with proper consideration given to the well-known fact that deferred maintenance is wasteful, an equation of mileage may easily be arrived at and used successfully as a basis for the distribution of forces. According to replies to the questionnaire, about one-half of the 29 answers received show that rules for equating mileage are being used, and that of the 15 roads reporting the use of this method 14 report satisfactory results, the exception being explained in a statement to the effect that the basis employed is not the most suitable to the local conditions.

### Many Variations in Practice

Because of the widely varying practices on different systems it will be found impossible to apply standards for equating mileage successfully on different railroads, some of these practices being as follows:

The maintenance of street and highway crossings is done by track forces on some systems, while on others such work, as well as fence construction and maintenance, is done by bridge and building forces.

Some systems entirely eliminate hand labor of track forces in weed destruction through the regular use of chemicals or other means.

On some railways ditching is done by machine ditchers, while on others this work is done by hand.

Some systems require track forces to perform certain duties incident to the cleaning of station buildings, etc., thus taking away from track maintenance men who have been authorized for track work.

Among other difficulties that will be encountered in an attempt to make any equation of general application, the following will be found important:

The greatly varying number of annual tie renewals, ranging from less than 100 to more than 200 per mile.

The higher standards of joint maintenance on some systems, through continued use of approved methods for building up battered rail ends.

The more general use of labor-saving machinery, etc.

The lack of sufficient supervisory officers and assistants, resulting in the slow education and development of foremen and laborers.

The lack of standardization or approved efficient methods of performing different items of work.

The equation of mileage in yards must of necessity include careful consideration of traffic density, age of tracks, weight and condition of rail and ballast, seasonal changes in business which might permit work to be done at a time of lessened interference from traffic, or in yards of some reserve capacity when tracks can be given over during the time necessary for periodic maintenance work.

The discussion which followed the reading of the report clearly indicated agreement with the report on the part of those present. The speakers were particularly insistent that the supervisory officer, who necessarily bears the responsibility for the condition of the track under his jurisdiction, should also have the

authority to distribute his force allotment in accordance with the dictates of his own judgment. While thus clearly indicating opposition to a hard and fast plan of equating mileage, it was conceded that some basis for the distribution of force was necessary but that this basis must necessarily be changed from time to time as conditions in the various track sections are subjected to change. Discussions of the basis of force allotment to the maintenance of yard tracks and yard leads stressed the excessive loss of time resulting from the inability to work on such tracks advantageously by reason of their occupancy and use while the work is in progress, and it was suggested that inasmuch as marked success had been obtained in the conduct of major renewals on main tracks by securing the uninterrupted use of such tracks, much would be gained by calling the attention of the transportation department to the opportunities for similar economies by making corresponding arrangements with respect to maintenance work in yards.

## Track Maintenance as Affected by Signal Operation

By R. A. Sheets

Signal Engineer, Chicago & North Western, Chicago

An analysis covering only seven years on the railroad with which I am connected, shows that the signal department has installed devices which have made possible annual savings in operation amounting to \$625,000 annually. Of this saving \$440,000 is due to signals and interlocking and \$185,000 to highway crossing protection. This means that these installations, which are basically electrical in their operation and automatic in their functions, must be guaranteed to operate as intended. The signal department can install all the wires and other apparatus but the proper operation rests directly upon the maintenance of the track over which the trains move.

No matter how well the track is maintained, it is necessary for the proper operation of automatic signaling devices that every rail joint be bonded. As these bonds cost in the neighborhood of 30 to 40 cents per joint applied, it should be evident that an unbonded joint is something serious and that it is just as much the duty of a track man to report an unbonded joint which may cause the unnecessary stopping of trains as it is for him to require the proper bonding of a new rail when it is installed.

No matter how expensive an installation of signaling devices has been provided and no matter how well bonded the rail is, it is impossible to guarantee proper operation of signals unless the track ballast is properly drained. When it is understood that the battery applied at one end of the track circuit must flow down one rail and back through the other to operate the signaling devices properly and that these rails touch the ground at every foot of their length and that it is the tendency of the battery energy to cut across from rail to rail instead of going to the place desired, it should be self-evident that water, salt brine, zinc-treated ties, mud and any dirt has a tendency to promote this leakage.

In order to provide the proper safety factor in the operation of automatic signals it is necessary that the signal circuits be connected through switch circuit controllers which will check the position of all switch points in main track. When it is considered that a switch with the point open  $\frac{1}{4}$  in. is a menace to safe train operation and that the signal must indicate stop under such conditions, it is quite evident that the adjustment of these circuit controllers is very important. The track foreman can quite easily throw such delicate adjustment out of order by the most incidental of repairs to switch points or stands. The track man should call on the signal maintainer for an inspection of such switches, even though his work consisted only of tamping up a tie or tightening a rail brace.

There is one point of contact between the signal and the track departments which is of the most vital importance and which perhaps causes the most friction. No matter how expensive the signal installation or how important it is in the scheme of railroad operation or how well it is maintained by the signal department, it cannot be a success unless the insulated joints are properly installed and maintained. Most railroads purchase the best of material, therefore proper maintenance is the only remedy for our difficulty with these joints. Most trackmen do not really understand that a broken-down insulated joint due to a crushed end post or worn fibre

or damaged bushings, may result in producing a potentially unsafe condition.

Insulated-joint maintenance can be greatly reduced if the joints are properly and carefully assembled and the steel is properly anchored to relieve them of undue strain. The joints themselves should not be anchored. Bolts should not be driven through or bent in order to get them in place, but the whole joint should be looked at as a piece of apparatus costing the railroad some \$12 and if properly installed should be good for approximately a year in main track, and considerably longer in secondary track. If roadmasters and trackmen would look at these joints as a necessary evil, provide the proper tools and equipment for installing and repairing them and make the same effort to keep them in good condition that they do in keeping up other parts of the track, I believe this problem would solve itself automatically.

With these few comments on the main points of contact between the two departments, I believe you will agree that there is nothing in the signal requirements which should afford any justification for friction between signal maintainers and track foremen. I will agree that signal maintainers are sometimes unreasonable in requesting track foremen to make emergency repairs, but the responsibility for signal failures must of necessity rest directly on them. Track foremen are considered competent and qualified and if properly backed up by the roadmasters, I am sure that they would ordinarily take care of many maintenance renewals without any direct suggestions from the signal maintainer. Too often, however, track foremen feel that this signal maintenance is not a regular part of their duties, but obviously, this attitude can only be explained by the failure of the roadmaster to provide properly for such work in his track maintenance allowance.

As a concluding thought may I suggest that signal supervisors and roadmasters become better acquainted, to the end that neither will feel that the other is trying to put something over.

In the discussion of this paper it was brought out that through better track maintenance and improved materials, the life of insulated joints has been increased materially. The consensus was that better results are obtained by making signal maintainers responsible for the maintenance of insulated joints and requiring simultaneous inspections of such joints and of switches by the section foreman and signal maintainer, and periodic inspections at which the roadmaster and signal supervisor are also present. The signal maintainer should order insulating material and distribute it to the section foremen according to their needs. Where these arrangements are in effect friction between the two departments has been eliminated.

## Economics of Power Equipment

The Committee on Getting the Most From Labor-Saving Equipment submitted a report that comprised an outline of the basic requirements for the successful use of power appliances. Excerpts from the report follow. It was presented by the committee chairman, W. O. Frame, district engineer maintenance of way, Chicago, Burlington & Quincy.

The selection of work equipment should never be a one-man job. Many maintenance-of-way officers on most railroads have been confronted with the problem of trying to produce results with equipment that was not properly designed to do the work that was expected of it and in such cases the subordinate employees and even the officers have often become discouraged and reluctant to give other labor-saving machinery a fair trial.

We still have difficulty in securing enough entirely competent work-equipment operators and are forced to use men who have had only a small amount of mechanical training. Under this condition we are going to get better performance from the more rugged and simply-operated machine.

Standardization and interchangeability of parts are particularly vital necessities in both the maintenance and operation of roadway equipment. As this is worked out, it will mean that we will be able to reduce greatly the stock of repair parts now carried and can make greater use of parts salvaged from worn out machines when they are dismantled. To be fair with the railroads and for their own interest, we feel that the manufacturers of work equipment for use on railways would do well to give the matter of further standardization of parts close study.

In selecting equipment, the initial cost is also to be con-

sidered. To insure that no mistake is made in selecting proper equipment to be purchased, we recommend that this matter be handled by a committee consisting of a representative of the mechanical department, the supervisor of work equipment and the system officer in charge of track maintenance.

## A Working Program

To insure the maximum output from roadway machines, it is necessary that the work to be performed by them be planned and that a comprehensive program be worked up sufficiently in advance so that all concerned will know just what is to be done and at about what time.

If the equipment is to be worked on only one division a program prepared by the division officer in charge of maintenance is sufficient. If it is to work on more than one division a list of the work to be done showing the date the equipment is wanted and the time it will be required should be made up by the division officers in charge of maintenance and submitted to the district officer in charge of maintenance who will program the work to be done on the district.

Certain major equipment such as steam shovels, pile drivers, track oilers, ballast cleaners, chemical weed destroyers, etc., is operated over a grand division or the entire system, that should have their work programmed from the general office, usually by the general manager, chief engineer maintenance-of-way and chief bridge engineer, who work up their programs from information furnished by the district officers in charge of maintenance. When programming work it should always be kept in mind that by spreading out the work where it is economical to do so over a greater period, a smaller investment in equipment will be required.

To a very large degree, the results we secure from work equipment are dependent on the field officer who supervises maintenance-of-way work, namely, the roadmaster, supervisor or division engineer. One of the principal leaks in the operation of work equipment is time paid for when no actual work is done by equipment, which is usually the time consumed repairing machinery, taking supplies and delays due to traffic and to traveling to and from work. The right kind of an organization will eliminate these delays to a surprising extent.

## Adequate Equipment Maintenance

To insure satisfactory performance and secure the maximum life from work equipment it is essential that it be properly maintained and kept in good repair. There should be a system supervisor of work equipment whose duty it should be to assist in selecting the equipment to be purchased, to keep a record of performance and cost of repairs, to employ operators and generally supervise the distribution of the equipment to be sure that it is adapted to perform the service required of it. An assistant to the supervisor of work equipment (or more than one if necessary) should also be provided. His services are very valuable in breaking in the younger operators. He will be in a position to inspect the equipment frequently and to see that it is being properly maintained, and that a sufficient stock of emergency repair parts is being carried. He also can inspect equipment when idle and arrange for repairs to be made so it will be serviceable when it is again needed.

A canvass of 10 railroads showed that the general practice of handling the shopping or general repairs to equipment is to send it to the shop at the end of the working season and have the operator in charge accompany the machine and assist shop mechanics in making repairs. This means steady employment for the entire year to the highest class of operators and assists materially in qualifying them mechanically so that they can take care of most of the repair jobs in the field during the working season and affords an opportunity to them to know thoroughly the machine they are operating.

## Intensive Use of Machines

Much can be done to increase the number of working days of maintenance machines during the season by making dual use of them. Compressors which are a part of pneumatic tie tamping and spiking and bolting outfits can generally be used to good advantage by the bridge and building forces in riveting, tearing out masonry, concrete, etc. The steel spreader and spreader-ditchers are excellently adapted for use in clearing snow and ice from tracks and they generally give better results than regular snow plows. The ditcher can be used with good success in loading rail, and many other units of equipment can be put to different uses.

The variety of uses, of course, can be overdone. We would not want to tie up a compressor with a paint-spraying outfit and have a ballasting gang tamping by hand due to the lack of the compressor, but with the equipment properly supervised, these errors will be avoided.



The introduction of this equipment has necessitated important changes in the methods and practices which have been followed heretofore in handling maintenance of way and construction work. These changes when made have not always met with favor on the part of the foremen and some of the supervisory officers.

To the man who is reluctant to take to the use of labor-saving devices, education should be directed in a patient, tactful way, rather than by force of authority. A good, plain discussion of the matter between the supervisory officer and foreman, we feel, will generally accomplish more toward securing the foreman's co-operation and best efforts to get desired performance out of equipment than any amount of written instructions.

### Discussion

The discussion of this report consisted largely in endorsing the views of the committee with respect to the training of operators and the plan of having operators retained in service to assist in or supervise the overhauling of equipment during the off season. Although there was some difference of opinion, the majority favored a system organization for the general supervision of the operation and maintenance of the increasing complement of power equipment now used in maintenance of way work.

## Looking Ahead in Maintenance of Way

By Lem Adams

General Supervisor, Maintenance of Way, Union Pacific System

Our problem is to maintain the track to proper line and surface at the lowest possible cost. But this cannot be done by the old hand-tool method under which most of us have been reared. We must turn to machinery to carry the burden of, and to speed up, our work. However, machines are expensive, and maintenance of way men have been somewhat backward in recognizing the benefits to be derived from machinery in track work. Further, we cannot convert our methods all at once, but must plan to get the most work possible from the number of machines available.

Is our present track organization best adapted for doing our major work with machinery? For miscellaneous spotting, policing and patrol, we must have a basic section force, but I see ahead of us the larger gang organization, with machines, not hand tools, for doing all the heavy work. Rail renewals and ballast work are now largely so handled, but we have overlooked our largest single item of maintenance of way expense—the cross-tie.

Why not have them renewed by a small specialized gang equipped with power tampers? Let the section foreman mark the ties to come out, and his small gang dress up the track after the renewals are made. I expect larger gangs to replace the section gang for all but regular housekeeping on the section, and this work will require a small gang.

Machines will not be operated skillfully by the so-called common laborer. We must train men as operators, and see that they are retained in service during the winter months (where you cannot keep them employed the year around) in order to have them on hand the following season. But, of course, we want to keep all machines working during as many of the twelve months as practicable, so figure out for yourself other jobs that your machine will handle more economically than if done by hand. In short, whenever you have work at hand, think of a machine that will help you to get it done quickly, and at the least expense.

Avoid sidetracking machinery that is furnished you because your foremen do not know how to use it effectively. See that they are taught how to use it. I recently heard of a rail-renewal gang that had been provided with several labor-saving devices and had only the rail crane in service—the foreman thought that their use slowed up his work.

It was only a few years ago that we accepted rail batter as inevitable, and considered that nothing could be done about it, while now most of us build up the worn ends to prolong rail life, and would regard it almost criminal to renew rail simply because of batter. In this connection, I recently witnessed the test of a tool that will very cheaply cut out the end overflow produced in cold rolling new rail, and, I think, greatly retard batter. Thus we find something new being developed almost constantly, the manufacturers are constantly working to develop new machines which will reduce the cost of our work.

Our problem is to keep up the property at the lowest possible cost, rather than maintain the best track possible regardless of expense. Think of your work in terms of money, and then spend it as if it were your own. You will find that you can cut down many items of expense that will aggregate a great deal of money. Eliminate unnecessary work, and know at all times that your men are doing something constructive, and for the betterment of your track or the required appearance of the property. Some of our maintenance engineers will say that it is their job to figure out the money, and yours to do the work, but it is my thought that you are the men that can save the money by getting your work done in the most economical way.

[The activities of the convention in its concluding sessions will be reviewed in the succeeding issue, that for October 4.—EDITOR.]

## Freight Car Loading

WASHINGTON, D. C.

REVENUE freight car loading in the week ended September 13 failed to maintain the gain that had been shown in three weeks preceding the Labor Day holiday and was less than that for the last week of August. The total was 965,713 cars, a decrease of 187,561 cars as compared with the corresponding week of last year and of 172,347 cars as compared with 1928. All commodity classifications showed reductions as compared with both 1928 and 1929 and reductions as compared with both years were also reported from all districts. The summary, as compiled by the Car Service Division of the American Railway Association, follows:

Revenue Freight Car Loading			
Week Ended Saturday, September 13, 1930			
Districts	1930	1929	1928
Eastern .....	215,793	259,385	254,739
Allegheny .....	194,033	234,351	231,226
Pocahontas .....	57,753	66,726	61,710
Southern .....	129,695	154,607	151,140
Northwestern .....	147,962	180,138	176,947
Central Western .....	142,712	166,453	170,871
Southwestern .....	77,765	91,614	91,427
Total Western Districts.....	368,439	438,205	439,245
Total All Roads .....	965,713	1,153,274	1,138,060
Commodities			
Grain and Grain Products.....	49,940	52,890	57,009
Livestock .....	26,926	29,273	34,362
Coal .....	159,889	188,234	180,672
Coke .....	8,145	11,370	9,723
Forest Products .....	40,776	64,826	65,192
Ore .....	50,787	69,600	63,932
Merchandise, L. C. L.....	242,728	269,387	266,821
Miscellaneous .....	386,522	467,694	460,340
September 13 .....	965,713	1,153,274	1,138,060
September 6 .....	856,637	1,018,481	991,385
August 30 .....	984,504	1,162,100	1,116,711
August 23 .....	940,549	1,137,966	1,080,698
August 16 .....	922,823	1,137,567	1,057,909
Cumulative Total, 37 weeks..	33,255,755	37,549,492	35,883,666

The freight car surplus for the period ended September 8 averaged 404,450 cars, a decrease of 13,867 cars as compared with the last week in August. The total included 214,103 box cars, 137,494 coal cars, 22,873 stock cars and 12,956 refrigerator cars.

### Car Loading in Canada

Revenue car loadings at stations in Canada for the week ended September 13 totaled 77,342 cars, an increase over the previous week of 7,244 cars but a decrease of 4,836 cars from the same week last year.

	Total Cars Loaded	Total Cars Rec'd from Connections
Total for Canada		
Sept. 13, 1930.....	77,342	31,205
Sept. 6, 1930.....	70,098	29,554
Aug. 30, 1930.....	72,460	31,975
Sept. 14, 1929.....	82,178	39,244
Cumulative Totals for Canada		
Sept. 13, 1930.....	2,232,482	1,246,058
Sept. 14, 1929.....	2,490,053	1,526,654
Sept. 15, 1928.....	2,441,645	1,441,653



A Photograph of Members and Guests Made Tuesday Noon

## Communication Officers Meet in Toronto

*Telegraph and Telephone section of A.R.A. discusses  
developments and improved methods at  
annual convention*

**D**EVELOPMENTS in railroad communication facilities were discussed at the annual convention of the Telegraph and Telephone section of the American Railway Association at the Royal York hotel in Toronto, Ont., last week. The four-day meeting, which started on September 16, was attended by 165 members and 30 guests. P. F. Frenzer, superintendent of telegraph of the Union Pacific and chairman of the section, presided over the sessions. Those reports and papers which are of general interest to railway officers, are given in abstract herewith, while other reports of a more technical character are omitted or mentioned only briefly.

### Opening Remarks of Chairman

In his opening address Chairman Frenzer said that in his 40 years of service with the Union Pacific, he had watched closely the progress of the old Association of Telegraph Superintendents, now the Telegraph and Telephone section, A.R.A., and had observed that the work done in these associations had not only hastened the development of communication facilities which give reliable and satisfactory service to the railroads, but had also made this engineering knowledge readily available to all roads, both large and small. Mr. Frenzer extended a special welcome to two representatives of the National Railways of Mexico, N. J. Alba, inspector general of telegraph and telephones and L. Castro, Jr., first electrical engineer.

The officers elected for the coming year are: Chairman, J. L. Niesse, superintendent of telegraph, Cleve-

land, Cincinnati, Chicago & St. Louis; first vice-chairman, C. A. Plumly, superintendent of telegraph, Baltimore & Ohio; second vice-chairman, A. W. Flanagan, superintendent of telegraph, Southern Pacific. The Committee of Direction announced at the closing of the fourth day's session that the next annual convention would be held in Chicago, during the latter part of September, 1931.

The Railway Telegraph and Telephone Appliances Association held its annual meeting Wednesday morning at which time it elected officers for the coming year as follows: Chairman, J. J. Raftery of J. H. Bunnell & Co., New York; vice-chairman, Stanton Hertz, Copperweld Steel Co., Pittsburgh, Pa.; and secretary-treasurer, G. A. Nelson of the Waterbury Battery Co., New York. The appliances association held no exhibit in connection with the convention of the T. & T. section.

### Three Papers Presented

"Railroad communication problems are fundamentally similar to those encountered in the Bell System. As a result, the instrumentalities and practices developed for telephone company use are, to a large extent, applicable to railroad company use. Suitable Bell system circuits and equipment have, therefore, been made available to the railroad companies. Likewise by means of representation on the American Railway Association committees, and by participation in conventions and joint discussions wherever practicable, information regarding many of the more general telephone company practices has been incorporated in the Association





codes." With these opening remarks, F. A. Cowan of the American Telegraph & Telephone Company, proceeded to present an extensive explanation of the use of various Bell System services by the railroads, including dispatcher and way-station telephone sets, selector apparatus, private branch exchanges, loud-speaking equipment, telephone repeaters and loading coils.

A paper discussing the installation and operation of pneumatic tube systems was presented by W. V. McGuinness, pneumatic tube engineer of the Western Union Telegraph Company, which company employs pneumatic tubes primarily for transporting telegrams between main and commercial branch offices. They are also used extensively by the telegraph company for inter-departmental communication within buildings and offices. The same size of tubing and carriers, and the same general type of equipment are used in both systems. Mr. McGuinness explained in detail many important points in the construction and operation of tube systems which are applicable to similar systems installed by railways in office buildings, classification yards, etc.

A paper explaining the design and installation of toll cable in the Bell System was presented by Glen Ireland of the American Telephone & Telegraph Company, in which he described the present status of the toll cable network of the Bell System, indicating plans for its extension, and described recent improvements in toll cable, including tape armored cable, loading coils and telephone repeaters. In the desert country west of the Rocky Mountains, it is expected that open-wire construction, giving a service equivalent to that of cable, will be employed for a number of years to come. However, with this exception, it is of interest to note that all of the larger cities of the United States and Eastern Canada will, within a very few years, be interconnected by means of toll cable. The 1930 cable program involves the placing of about 5,000 miles of toll cable and associated items.

#### Use of Treated Poles

Information as to the number of treated and untreated poles used by certain railroads and commercial communication companies during 1929, was presented by the Committee on Outside Plants. In this report it was stated that the Burlington purchased and treated 36,601 yellow pine poles, the Great Northern purchased 14,175 treated poles, the Louisville & Nashville purchased 4,140 untreated chestnut and 17,877 treated yel-

low pine poles, while the Pennsylvania purchased 20,231 treated poles.

The report also included a large table giving the results of service tests of pole lines of treated wood poles. One line mentioned, built between Norfolk, Va., and Washington, D. C., in 1897, included about 1,594 southern pine poles treated with 12 lb. of creosote to the cubic foot by the full-cell process. About 1,282 of these poles are still in service, while only 66 have been removed on account of decay. With information as to the location of the line, the number of poles, the species of wood, the type of treatment, and character of soil, the notes on the condition of the poles at various periodical inspections reveal interesting facts on which to establish future practices.

This report was discussed by P. J. Howe, of the Western Union Telegraph Company, who added that tests of woods in which 15 different types of preservatives had been inspected had been under way for the last two years in Panama, where the conditions are such that a one-month test is equal to a year's service in most parts of Canada and United States. Up to June, the samples treated with creosote, nickel arsenate, zinc meta arsenite and one other preservative were perfect, while all others had failed.

#### Radio and Wire Carrier Systems

The report of the Committee on Radio and Wire Carrier Systems explained that the Canadian National has 60 two-way channels of high-frequency carrier telegraph similar to that used in the Bell System and is installing 50 additional carrier channels this year. The use of wire carrier systems has permitted the more intensive use of existing wires and has provided increased facilities at a cost materially below that which would have been incurred by the provision of sufficient physical wires to give the same increase. Four-channel multiplex sets are carried over sections as long as 1,200 miles and three-channel multiplex sets are operated between Toronto, Ont., and Edmonton, Alta., which distance is spanned by three carrier sections, and two-channel multiplex sets between Toronto and Vancouver, B. C., a distance of 2,707 miles, which is spanned by four carrier sections operated in tandem. The wire carrier systems are immune to the Northern lights with their accompanying earth currents. However, electrical storms accompanied by lightning or by the building up of charges of static electricity on line wires and adjacent objects produce interference in the carrier in

very much the same manner as static does in a radio set. Each one of the static hits or kicks tends either to produce a false operation of the relays in the carrier terminal panels or to disturb their normal operation. Considerable study has been given to methods of preventing interference by static electricity, but as yet none of these methods is entirely successful.

Continuing, the report explained that the Canadian Pacific has ten-channel carrier telegraph and telephone between Montreal and Vancouver by way of Toronto and from Montreal to Winnipeg direct via Sudbury. In addition ten-channel telegraph and telephone is operating between Winnipeg and Vancouver. This year additional carrier systems will be installed between Montreal and Windsor, Ont., and between Winnipeg, Calgary and Edmonton. The carrier system has given complete satisfaction. In the purchase of this carrier equipment it was agreed that the telephone would not be used for commercial telephone service. There are no limits to the use to which the carrier telegraph can be assigned. In operation it is most effective as it gives a capacity of 10-wires.

The report of the Committee on Radio and Wire Carrier System included also an explanation of the train telephone system which was inaugurated by the Canadian National on April 27, 1930, this being the first two-way telephone circuit to be placed in commercial public service on a moving train by any railway in the world. It was designed and developed by J. C. Burkholder, chief engineer of the Canadian National Telegraphs, with the co-operation of the Bell Telephone Company of Canada. This installation was described in detail in the *Railway Age* for May 3, 1930, p. 1053.

#### Economics of Communication

In the report of the Committee on Economics, I. C. Forshee, (Penna.), chairman, discussed the results of a questionnaire sent by the committee to numerous roads showed that the use of aluminum figures for marking pole lines saved an average of \$1 per mile each year, in addition to other advantages, including decreased maintenance, increased legibility, immunity to weathering, ease of change from an old pole to a new one and their necessity on treated poles.

Nineteen roads reported the use of 76,192 guy anchors, with an average savings of \$2.50 per anchor as compared with wood logs or "deadmen."

Telegraph printers were reported in service by 23 companies, using a total of 291 printers on 118 circuits. The savings effected by the printers as compared with other means of transmitting messages varied from 21 to 50 per cent. Nine roads gave actual savings of \$135,800 on 121 printers, or an average of \$1,122 per year.

One company reported a saving of 85 cents per hole in digging 1,516 holes by the use of power machines, as compared with hand operation, or a total saving of \$1,288. Another road set 1,516 poles with one machine in six weeks at a saving of 52 cents per pole.

#### Message Traffic

The Committee on Message Traffic, G. D. Hood (C. R. I. & P.), chairman, recommended several ways of improving methods of handling telephone and telegraph service, including an official censor reporting to and working under the authority of an officer having jurisdiction over all departments. His work should be largely educational among the users of the telegraph and telephone for the purpose of increasing the general efficiency of the railroads through the proper use of communication service. Brevity in preparing messages and the elimination of unnecessary communications can

be brought about only through the education of those using these services.

A centralized method of car tracing was recommended. The practice of traffic representatives wiring superintendents and yardmasters at various terminals promiscuously results in a large number of unnecessary telegrams. Tracers should not be sent until manifest or passing reports have been scrutinized and it is found that the car is not shown thereon. Generally, when it is necessary to trace, cars can be located by addressing a message to one particular point instead of communicating with various points along the route. Further tracing should not be done until a reply has been received from the point addressed.

A new form was recommended for the recording of long-distance telephone calls so that the proper officers can keep a check on the use of message circuits and thereby prevent the overloading of the facilities with unimportant business.

The recommendation for the appointment of an official censor of telegrams aroused considerable discussion. J. L. Niesse (C. C. C. & St. L.) advocated that the censor should work under the jurisdiction of the communication officer. J. A. Jones (Southern) explained that a circular had been issued by an executive of his road to the effect that it was the duty of the superintendent of telegraph to censor telegrams and that effective results had been accomplished by co-operating with the heads of various departments in eliminating unnecessary words in messages.

In contrast to this method, R. A. Hendrie (M. P.) explained that the Missouri Pacific had appointed a committee, including the secretary to the president, the assistant general manager and the superintendent of telegraph, to study the censorship of telegrams. The superintendent of car service was assigned as censor because he was informed as to the communications that must be handled by telegram. During the first month of censorship \$4,700 was saved in telegraph charges.

J. A. Jones stated that the Southern had attempted to use the form recommended by the Committee on Message Traffic for recording long-distance telephone calls, but that the time required to fill it out delayed the service and would have required more operators if the practice had not been abandoned at once. In his opinion, all the information necessary was that required to check up on the bills from outside communication companies for service over their lines. R. A. Hendrie (M. P.) explained that the Missouri Pacific used a smaller form that required less information and that the operators soon learned to fill it out without delaying the service. The use of slips of different colors for executive, operating and other officers, expedited the handling of the more important calls. A study of the tickets, in co-operation with the heads of various departments, not only reduced delay time, but actually permitted an increase of 33 per cent in the number of calls. G. R. Stewart (I. C.) pointed out the desirability of keeping such records as a means of determining the return on the investment in the telephone plant owned by the railroads, as well as to know when additional facilities were justified.

The Committee on the Education and Training of Communication Employees, C. O. Overbey (A. T. & S. F.), chairman, presented a list of 384 questions with answers, to be used in determining the qualifications of wire chiefs. It is not expected that each individual will be required to answer all the questions, but selections may be made to meet the requirements. Likewise, the entire list can be used as a guide for men preparing for the position of wire chief.



The Committee on Communication Development, J. A. Jones (Penna.), chairman, presented rather detailed explanations of 27 new devices or methods which have been developed in the communication field during the last year, among which were cable bonding devices, solderless copper for cable conductors, ground resistance measuring devices, a high-speed repeater for simplex circuits and new types of simplex printers.

The Committee on Accidents and Fire Prevention and First Aid for Communication Employees, L. A. Lee (P. & L. E.), chairman, presented instructions for the prevention of fire in communication plants, and a plan for educating and training supervisory forces and employees in accident prevention.

## Accidents Investigated in February and March, 1930

**A**CCIDENT investigation bulletin No. 43 which has been issued by the Bureau of Safety, Interstate Commerce Commission, contains abstracts of the reports made by Director W. P. Borland on nine investigations of train accidents made by inspectors of the bureau in the months of January, February and March, 1930. Those reports covering the month of January were abstracted in the *Railway Age* of September 20, page 580. The nine cases occurring in February and March are reported below; five collisions and four derailments.

### February

*Chicago, North Shore & Milwaukee*, Kenosha, Wis., February 23, 10:45 p. m.—Southbound passenger train No. 436, consisting of five electric cars, all motors, moving at full speed was derailed by striking an automobile at a crossing; and some of the cars struck a northbound freight train, passing at the same moment, and the freight also was derailed. The two men in the automobile and nine passengers on the train were killed, and 132 persons were injured. Three of the injured passengers subsequently died, making 14 deaths in all. The automobile approached the crossing at high speed, passed around another automobile which was at a standstill awaiting the passage of the trains, and ran upon the track without the driver apparently seeing the passenger train, although there was a good view of it. It is believed that this driver saw the freight train and intended to clear the crossing before the train reached it; and, having his mind on the freight, did not look toward the north. An automatic wig wag signal was in operation at the crossing and at least one of the trains had sounded the whistle.

*New York, Chicago & St. Louis*, Edwardsville, Ill., Friday, February 14, 8:28 a. m.—Westbound second-class freight train No. 43, first section, one hour and 24 minutes late, moving at 25 miles an hour or faster, collided with eastbound second-class freight train No. 32, traveling somewhat more slowly, and the locomotives were badly damaged and six cars wrecked. Five trainmen were injured. The engineman of the westbound train was injured and no statement was obtained from him. The eastbound train is run only on Monday, Wednesday and Friday and the entire crew of the westbound train overlooked its schedule. Every member of this crew was a promoted man with from 14 to 20 years' experience and the only reason for their forget-

fulness or neglect, that the inspector can find, is that they were in a hurry to leave Edwardsville and that the other train runs only every other day. The report finds that on this section of the road there are 21 trains a day, which warrants serious consideration of the need of the block system. Furthermore, this need was called to the attention of the company on March 26, 1929, when a collision occurred near Edwardsville; on June 13, 1928, when one occurred near Swanville, Pa., and on October 25, 1929, when, in connection with an accident at Dean, Pa., the same recommendation was repeated. At that time, it was said that plans were under consideration for the installation of an automatic block system. In view of these four collisions, serious consideration of the entire traffic situation on the line "seems to be warranted."

### March

*Southern*, Rome, Ga., March 2.—Northbound passenger train 102, standing at the station, having been there about five minutes, was run into at the rear by northbound passenger train No. 4, moving at low speed; 19 passengers, four Pullman employees, two mail clerks and eight railroad employees injured. Train No. 4 had passed cautionary and stop signals, the engineman having forestalled the operation of the automatic train control at both these signals. The engineman claimed that he was running under control, and that the trouble was that he misjudged the speed of his train. The line is curved and some freight cars interfered with his view, but still he could have seen the standing train soon enough to stop. The superintendent had had a conference with enginemen a short time prior to this date and a special circular had been issued concerning train movements within yard limits, but this engineman said that he could not recall either a conversation with the superintendent or the letter from the general superintendent. The report, holding the engineman responsible, passes no censure on the flagman of the standing train, who was back 245 ft. and could have been seen an additional distance of 800 ft. The engineman, when he finally saw the standing train and was sure it was on the main track, made only a service application of the brakes when he might have applied them in emergency.

*Baltimore & Ohio*, Altamont, Md., March 2.—An eastbound freight train moving at 14 miles an hour or slower, was run into at the rear by a following express train, consisting of locomotive No. 4434, eight express cars and one coach; and the caboose of the freight was overturned and destroyed by fire. The engineman and fireman of the helping engine at the rear of the freight and two other trainmen were injured. The engineman of the express train is held at fault for not running under proper control, he having received a permissive block signal. There was a blinding snow storm at the time. The report holds that the speed was much higher than the rate estimated by the crew. Two brakemen had been uneasy about the speed but did not call the attention of the engineer or the conductor to it. The conductor of the freight claimed to have dropped a lighted fusee between the caboose and the helping engine but there is nothing to confirm his statement.

*Erie*, Freedom, Ohio, March 4, 2:10 a. m.—A freight train of 99 cars and one caboose, moving over an undulating grade, broke in two at the twenty-sixth car; and the helping engine at the rear of the train, not having the airbrakes connected, crushed the caboose; and a brakeman, between the engine and caboose, was killed; one other trainman was injured. The rule requiring air-

brakes to be connected through to the pushing engine had not been observed and when the brakes went on automatically, the caboose was forced up and over the pilot of the locomotive. Old defects were found in the coupler yoke which failed and caused the separation of the train, but these could not have been discovered except by careful inspection at the repair tracks. The report calls attention to an accident at Flippen, Ga., on February 15, 1928, where failure to connect the air-brakes through had caused a similar disaster.

#### Sixty-five Injured

*Central of Georgia, Zellobee, Ga., March 7, 5:05 a. m.*—Westbound passenger train first No. 9, consisting of locomotive No. 472 and 13 cars, having been flagged, and being in motion at about 10 miles an hour, was run into at the rear by second No. 9 moving at from 25 to 45 miles an hour, making a bad wreck. The flagman of first No. 9 (on the observation car) was killed and 56 passengers, five employees and four Pullman porters were injured. There is no block system on this line, and no telegraph offices were open between Americus and Columbus, 64 miles. (Zellobee is 36 miles west of Americus.) Train No. 9 is often run in two sections and the use of fusees is intended to be managed with special care. The second section in this case consisted of express cars and these cars usually are run ahead of the train that is made up of passenger cars. The flagman who was at fault was a man of experience and he must have known that the second section was liable to close up on the first section when flag stops were made; the inspector can find no explanation of his failure to throw off a fusee when the speed of his train was reduced; nor why he took no steps toward saving his own life; the speed of the train was low and he could have got off easily before the locomotive struck the car on which he was riding. He had swung his white light, but not soon enough to give adequate warning. The engineman of the second section said that the flagman appeared to be paralyzed and made no attempt to leave the car. On this section of the road there are during the night only one passenger and one freight train in each direction, and the report makes no recommendation as to the need of a block system. First No. 9 had been flagged by the track foreman who was looking for possible damage by heavy rain.

#### Trouble at a Private Crossing

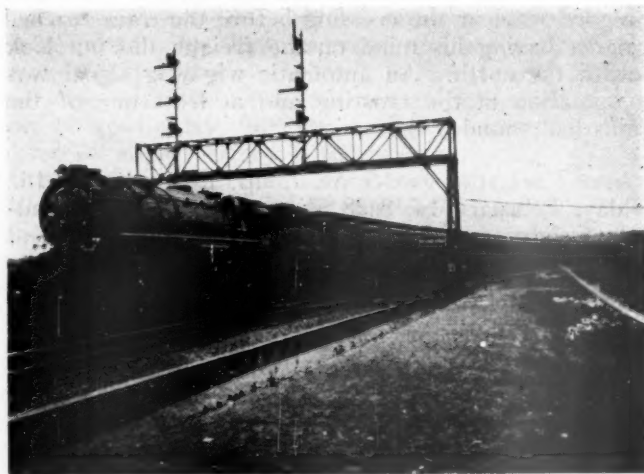
*Chicago & North Western, Arlington Heights, Ill., March 18, 8:55 p. m.*—Eastbound passenger train No. 516, moving at about 45 miles an hour was derailed by a skid, lodged on the track at a private crossing, and the locomotive was overturned, making a bad wreck. Westbound passenger train No. 687 came on before there was time to give warning of the obstruction, and the front of this train also was wrecked. The engineman of the westbound train was killed and 20 passengers, nine employees and one mail clerk were injured. The skid which caused the derailment was used by a contractor to move heavy sections of sewer pipe across the track, and in this case no flag protection was provided. A clevis in the chain, by which a tractor drew the skid, broke, and the men in charge were unable to make repairs in season to escape the train. By arrangement with the contractors using the crossing, the railroad company employed a flagman during the day, 7 a. m. to 7 p. m. and, says the report, "it was very poor judgment on the part of the contractors in not notifying the railway company that movements over the track were to be continued during the night time." The men in charge claimed to have tried to signal the train

with a red lantern, but the government inspector thinks that no effective signaling was done.

*Pennsylvania, Toledo Junction, Ohio, March 23, 3:44 a. m.*—Westbound passenger train No. 105, consisting of locomotive No. 3800 and 13 cars, moving at from 20 to 40 miles an hour, was derailed as it entered a No. 20 crossover, and the locomotive was overturned. The engineman was killed and the fireman and two passengers were injured. The cause of this derailment was a chipped switch point; a new switch point which had been in place 15 days and which, because the stock rail was somewhat worn, did not fit snugly against the rail. Various inspections had kept track of the fact that the switch point was not in perfect condition, but reports had indicated that it was not unsafe. The government report finds that "there is little excuse" for allowing the switch point to continue in service until a train was derailed. It was found also that the leading truck wheels of the locomotive were not perfectly fitted and the flange of the left wheel had been wearing too rapidly; this also, like the defective track conditions, "should have been corrected before it caused a derailment."

*Pennsylvania, Frankford, Pa., March 28, 11:48 p. m.*—A westbound freight train consisting of locomotive 1695, and 47 cars, was derailed while entering a crossover at high speed—some thought 50 miles an hour—and the locomotive was overturned. The first 14 cars were piled up within a space of 100 ft. behind the tender, blocking all four tracks. The engineman and fireman were killed. The authorized maximum speed for freight trains on this four-track line is 50 miles an hour over the New York division, but only 40 miles an hour on the Philadelphia Terminal division, which the train had just entered. The conductor thought the maximum had not been exceeded at any point on the 54-mile journey from Metuchen, during which time no stops had been made. The engineman was killed, and why he did not properly control his speed cannot be known. A work train was standing on another track near the point of derailment, engaged in wire service connected with electrification and it is noted that the freight was using steam as it passed, which was in violation of a rule requiring steam to be shut off when passing the wiremen working on outriggers. The engineman who was killed had been a runner since November, 1913.

\* \* \*



The "Southwestern Limited" on the Boston & Albany Near Riverside, Mass.



# Burlington Operating Efficiently

*Operating ratio at 71.3 in spite of 11.3 per cent revenue decline—Steady program of capital expenditures*

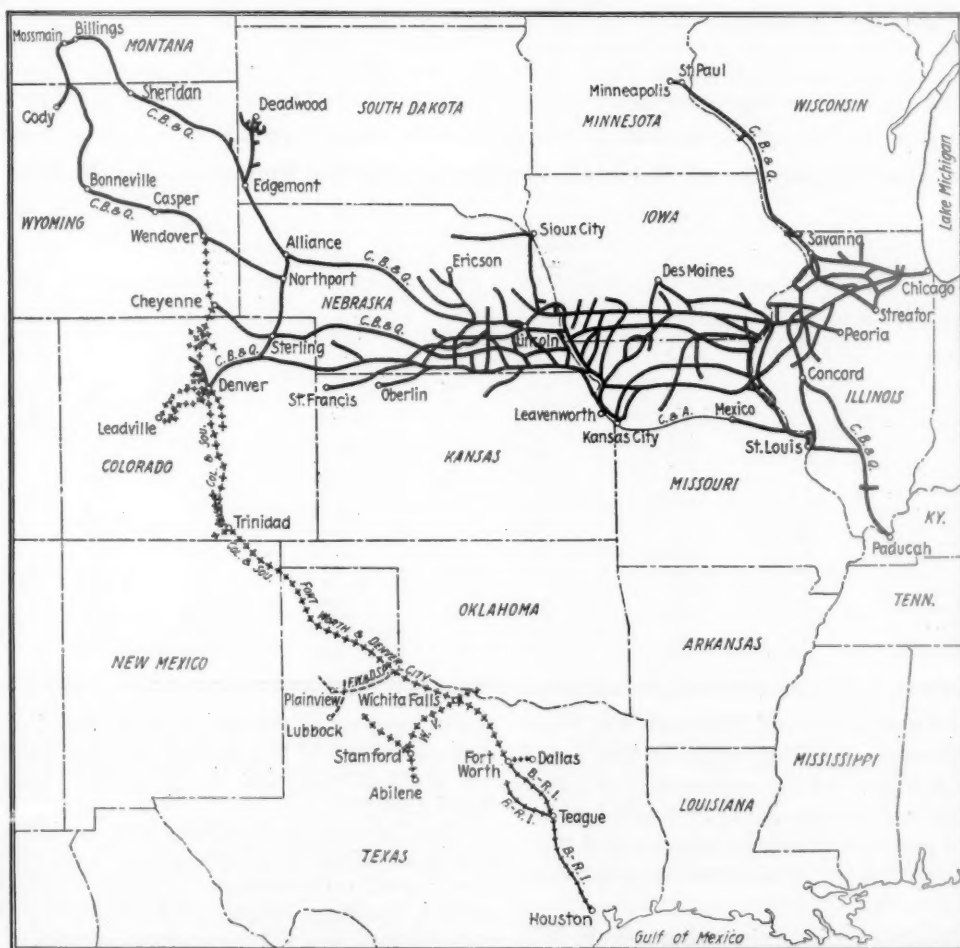
THE Chicago, Burlington & Quincy in the first seven months of the current year had total operating revenues of \$80,150,061, a decrease of 11.3 per cent from the same period of last year. Operating expenses declined 8.9 per cent to a total of \$57,114,189 and net railway operating income totaled \$14,881,405—a decrease of 20.3 per cent from the first seven months of 1929, but a distinctly favorable showing in the light of the current business depression. The Colorado & Southern in the seven months of 1930 had operating revenues of \$5,788,141, a decline of 11.1 per cent from last year. Operating expenses, however, totaled only \$4,631,652, a decrease of 14.1 per cent from the first seven months of 1929 (accounted for largely by a decrease of 18.9 per cent in maintenance of way expenses and of 22.2 per cent in maintenance of equipment); so that net railway operating income, totaling \$513,397, was actually 9.5 per cent greater than for the same period of 1929. The Fort Worth & Denver City suffered a relatively greater decline in operating revenues, the total for the first seven months of the current year being \$5,814,517, or 17 per cent less than in the same period of 1929. Operating expenses totaled \$4,140,030, a decrease of 10.6 per cent, and net railway operating income, \$1,252,234, was 32 per cent less than in the first seven months of 1929.

The operating ratio of the Burlington for the first seven months of the year was 71.3; of the Colorado & Southern, 80.0; and of the Fort Worth & Denver City, 71.2. Comparative freight service operating statistics for the three railroads for the first six months of the current year as compared with the same period last

year are given in Table II. Decreases, it will be noted, are shown in almost every category. The Burlington, however, showed a decline of 13.8 per cent in freight train-hours, in contrast with a decrease of 10.9 per cent in gross ton-miles. It showed also a fractional increase in cars per train and increases in train speed, gross ton-miles per train-hour and net ton-miles per train-hour of 4.5 per cent, 3.4 and 1.7 respectively. Coal consumption per 1000 gross ton-miles declined 3.8 per cent and unserviceable freight cars, 8.9 per cent. The Colorado & Southern and the Fort Worth & Denver City likewise showed improved fuel efficiency, the decline in coal consumption per 1000 gross ton-miles being 3.6 per cent for the former and 4.8 for the latter. The C. & S. had a gratifying increase of 2 per cent in the ratio of loaded to total car-miles, and a decrease of 14.5 per cent in unserviceable locomotives and of 22.4 per cent in unserviceable freight cars. The Fort Worth & Denver City increased its average tons per car by 5.6 per cent and its average train speed by 2.2 per cent. The decrease in unserviceable equipment on the latter road was 10.4 per cent for locomotives and 10.1 per cent for freight cars.

The Burlington's operating revenues in 1929—\$162,-

409,925—were not record-breaking. Indeed, they were slightly lower than in 1928 and were exceeded also in each of the years 1920-24 inclusive. The operating ratio, however, was consistently reduced from 88.52 in 1920 to 68.69 in 1929, with the result that net railway operating income in 1929 reached a total of \$35,357,963, as compared with \$32,912,367 in 1928, the best previous post-war year. Net income, after the payment of all charges, totaled \$29,576,538 in



The Burlington and Its Subsidiaries

1929, as compared with \$26,278,252 in 1928 and only \$21,443,123 in 1927. Operating revenues of the Colorado & Southern in 1929 totaled \$12,230,275, as compared with \$12,303,314 in the preceding year. Net operating revenues were \$2,995,635, the highest of any year since federal control, except 1928, when they were \$3,094,610. Net railway operating income totaled \$1,774,618, the highest figure reached in any year since 1926,

per cent of their freight service revenues from transportation of agricultural products (5.35 per cent from wheat, 3.43 per cent from cotton, 3.17 per cent from potatoes, 2.23 per cent from corn); 5.03 per cent from animal products; 23.46 per cent from mine products (12.71 from bituminous coal); 3.90 per cent from forest products; 34.54 per cent from manufactures and miscellaneous (11.45 per cent from refined petroleum

Table I—Revenues and Expenses—Seven Months

	C. B. & Q.			C. & S.			F. W. & D. C.*		
	1930	1929	% change + or —	1930	1929	% change + or —	1930	1929	% change + or —
Freight Revenue .....	\$62,022,301	\$69,962,310	—11.4	\$4,783,143	\$5,275,995	—9.3	\$4,611,962	\$5,566,171	—17.1
Passenger Revenue .....	9,218,906	10,794,889	—14.6	469,948	628,199	—25.2	779,367	963,234	—19.1
Total Operating Rev. ....	80,150,061	90,359,042	—11.3	5,788,141	6,508,053	—11.1	5,814,517	7,005,808	—17.0
M. of W. Expense .....	11,663,938	13,243,833	—11.9	915,650	1,128,607	—18.9	814,097	939,585	—13.4
M. of E. Expense .....	12,344,886	14,347,189	—14.0	1,160,667	1,491,246	—22.2	1,063,078	1,152,186	—7.7
Transportation Exp. ....	27,564,228	29,787,088	—7.5	2,121,681	2,335,768	—9.2	1,831,013	2,071,670	—11.6
Total Oper. Exp. ....	57,114,189	62,680,929	—8.9	4,631,652	5,390,726	—14.1	4,140,030	4,630,400	—10.6
Operating Ratio .....	71.3	69.4	+ 2.7	80.0	82.8	—3.3	71.2	66.1	+ 7.7
Net Ry. Oper. Income .....	14,881,405	18,667,923	—20.3	513,397	469,065	+ 9.5	1,252,234	1,842,547	—32.0

\* Not including Wichita Valley.

with the exception of 1928 when the total was \$1,957,437. The Fort Worth & Denver City had operating revenues of \$12,396,410, the highest of any year since 1926. Net operating revenue totaled \$4,482,069 and net railway operating income \$3,503,073, the former figure being exceeded only in 1926 and the later comparing with the 1928 total of \$3,651,576.

#### Diversified Traffic

The Burlington in 1929 derived 19.09 per cent of its freight revenues from agricultural products (5.72 per cent from wheat and 4.95 per cent from corn); 10.75 per cent from animals and their products; 22.54 per cent from mine products (16.65 per cent from bituminous coal); 4.93 per cent from forest products; 31.11 per cent from manufacturers and miscellaneous (7.55 from

and gasoline); and 7.8 per cent from l.c.l. traffic. The average haul per ton was 192.08 miles and the average revenue per ton-mile was 1.237 cents. Passenger revenues in 1929 totaled \$2,957,505, representing 11.32 of total operating revenues and a decrease of 10.2 per cent from 1928.

#### Net Income High in 1929

The Burlington owns approximately 68 per cent of the outstanding stock, preferred and common, of the Colorado & Southern which, in turn, owns virtually all the stock of the Fort Worth & Denver City and the Wichita Valley. Net income of the Burlington in 1929—\$29,576,538—exceeded its dividend requirements (10 per cent) totaling \$17,083,850, by \$12,492,688, which latter was transferred to profit and loss. The company's cor-

Table II—Comparison of Selected Freight Operating Statistics—Six Months

	C. B. & Q.			C. & S.			F. W. & D. C.		
	1930	1929	of change Per cent Inc. Dec.	1930	1929	Per cent of change Inc. Dec.	1930	1929	Per cent of change Inc. Dec.
Mileage operated .....	9,287	9,317	0.3	1,037	1,034	0.3	695	694	0.2
Gross ton-miles (thousands)....	14,152,477	15,883,604	10.9	894,305	1,008,205	11.3	802,233	852,913	5.9
Net ton-miles (thousands)....	6,280,834	7,165,298	12.3	413,710	476,070	13.1	328,496	346,854	5.3
Freight train-miles (thousands)...	7,823	8,674	9.8	608	677	10.2	528	549	3.8
Freight locomotive-miles (thousands) .....	8,580	9,425	9.0	682	763	10.6	537	565	5.0
Freight car-miles (thousands)...	385,984	427,510	9.7	21,623	24,320	11.1	21,268	22,940	7.3
Freight train-hours .....	557,196	646,525	13.8	48,881	54,840	10.9	37,910	40,214	5.7
Car-miles per day .....	34.6	37.0	6.5	19.6	22.9	14.4	27.2	32.2	15.5
Net tons per loaded car .....	26.2	26.4	0.8	29.4	30.7	4.2	24.4	23.1	5.6
Per cent loaded to total car-miles	62.1	63.5	2.2	65.1	63.8	2.0	63.2	65.5	3.5
Net ton-miles per car day .....	564	620	9.0	374	449	16.7	420	488	13.9
Freight cars per train .....	50.3	50.2	0.2	36.5	36.8	0.8	41.3	42.8	3.5
Gross tons per train .....	1,809	1,831	1.2	1,472	1,488	1.1	1,519	1,554	2.3
Net tons per train .....	803	826	2.8	681	703	3.1	622	632	1.6
Train speed, miles per train hr...	14.0	13.4	4.5	12.4	12.4	—	13.9	13.6	2.2
Gross ton-miles per train-hour...	25,399	24,568	3.4	18,296	18,384	0.5	21,162	21,209	0.2
Net ton-miles per train-hour...	11,272	11,083	1.7	8,464	8,681	2.5	8,665	8,625	0.5
Lb. coal per 1,000 gross ton-miles	127	132	3.8	163	169	3.6	138	145	4.8
Loco. miles per loco. day .....	59.4	60.5	1.8	45.8	48.6	5.8	46.3	47.6	2.7
Per cent freight locos. unserviceable	18.5	18.2	1.7	22.4	26.2	14.5	18.1	20.2	10.4
Per cent freight cars unserviceable	5.1	5.6	8.9	6.6	8.5	22.4	6.2	6.9	10.1

refined petroleum and gasoline); and 11.58 per cent from l.c.l. freight. The average haul in revenue freight service in 1929 was 274.96 miles and the per ton-mile revenue 0.985 cents. Passenger revenues in 1929 totaled \$18,817,973, being 11.59 per cent of total revenues and representing a reduction of 4.5 per cent from the preceding year.

The Colorado & Southern Lines (including the F. W. & D. C. and the Wichita Valley) in 1929 derived 25.27

porate surplus at the end of 1929 stood at \$226,142,693, equivalent to 132 per cent of outstanding common stock. Its gross income for the year 1929 was 4.1 times its fixed charges.

The Colorado & Southern had net income of \$3,422,826 from which dividends (4 per cent on preferred and 3 per cent on common) totaling \$1,610,000 were deducted, leaving a balance of \$1,812,826 to be transferred to profit and loss. The corporate surplus of this company at the end of 1929 was equivalent to 30.8 per cent of out-



standing capital stock. Gross income totaled \$5,584,731 (\$2,673,985 of this being dividend income), equivalent to 2.6 times fixed charges. Net income of the Fort Worth & Denver City totaled \$2,728,135, of which \$2,672,788 was appropriated for dividends. Its gross income was equivalent to 3.4 times fixed charges.

### Competition from the Highway

The Burlington, in common with most other railroads, is feeling the effects of competition from other forms of transportation and one or two paragraphs from its annual report for 1929 are significant in this connection. They read as follows:

"Animals and products, [i.e., transported in 1929] decreased 4.94 per cent, resulting from the lightest movement in several years. This was due largely to competition by truck haul, which is increasing rapidly. The tonnage of all kinds of livestock decreased 6.83 per cent. The company serves eight important markets and during the year 1929 approximately 18 per cent

"Low rate summer tourist traffic is constituting a larger proportion of our total traffic each year and the tendency to establish excursion rates for holidays and special occasions has resulted in a decrease in the average earnings per passenger mile from 3.088 cents in 1928 to 3.013 in 1929."

The company in 1929, recognizing the necessity of meeting this highway competition on its own ground, organized the Burlington Transportation Company and rapidly extended its motor coach operations during the year. It also acquired a substantial interest in the Pickwick Greyhound motor coach lines operating in its territory. The Colorado & Southern has, through subsidiaries, operated motor coaches in its territory since 1925.

### Liberal Capital Expenditures

The Burlington in 1929 continued its program of capital expenditures, net charges to that account being almost ten million dollars, about double the amount ex-

Table III—Chicago, Burlington & Quincy, Operating Results, Selected Items, 1920 to 1929

Year	Mileage	Revenue ton miles (thousands)	Revenue passenger miles (thousands)	Rev. per ton mile cents	Total operating revenues	Total operating expenses	Net operating revenues	Operating ratio	Net railway operating income	Net after charges	Net charges for additions and betterments
1920	9,390	14,130,364	1,314,984	0.932	185,270,768	164,017,388	21,253,380	88.52	8,100,104	22,924,364	14,738,485
1921	9,364	10,554,788	999,701	1.163	168,712,268	128,216,290	40,495,978	76.00	28,696,588	25,609,973	8,304,559
1922	9,364	11,754,596	941,748	1.033	164,916,471	126,777,703	38,138,767	76.87	25,152,174	20,261,488	19,359,165
1923	9,401	12,690,384	967,097	0.996	171,270,661	134,290,379	36,980,282	78.41	25,365,567	19,290,529	17,406,999
1924	9,407	12,287,748	909,302	0.975	162,674,878	119,958,734	42,716,144	73.74	28,742,112	21,899,829	9,537,772
1925	9,404	12,298,288	893,670	0.965	159,155,178	116,671,868	42,483,310	73.31	28,131,918	21,184,593	11,432,319
1926	9,392	12,651,222	871,773	0.960	161,317,442	116,462,808	44,854,634	72.19	29,955,831	23,987,968	6,889,525
1927	9,390	11,942,859	811,600	0.992	156,320,453	111,917,503	44,402,950	71.60	28,143,308	21,443,123	10,971,881
1928	9,375	12,931,723	730,970	0.982	162,891,409	114,191,159	48,700,250	70.10	32,912,367	26,278,252	4,420,551
1929	9,373	12,873,521	719,017	0.985	162,409,925	111,565,542	50,844,382	68.69	35,357,963	29,576,538	9,778,274

### Colorado & Southern

Year	Mileage	Revenue ton miles (thousands)	Revenue passenger miles (thousands)	Rev. per ton mile cents	Total operating revenues	Total operating expenses	Net operating revenues	Operating ratio	Net railway operating income	Net after charges	Net charges for additions and betterments
1920	1,099	882,016	95,128	1.359	13,816,741	11,342,899	2,473,842	77.49	2,606,066	537,271	537,271
1921	1,099	620,377	63,865	1.595	13,223,220	10,523,890	2,699,330	79.59	1,550,156	1,550,156	124,778
1922	1,099	739,339	56,293	1.396	13,196,236	10,894,665	2,301,572	82.55	834,759	834,759	2,325,535
<i>C. &amp; S. Lines</i>											
1923	1,825	1,263,036	131,475	1.401	12,675,913	11,154,293	1,521,620	88.	790,130	836,259	452,171
1924	1,820	1,391,213	129,487	1.416	12,866,948	10,139,487	2,727,460	78.80	1,779,941	1,764,689	892,747
1925	1,804	1,426,518	122,321	1.374	12,365,588	9,715,875	2,649,713	78.57	1,617,166	1,650,982	711,236
1926	1,819	1,632,849	133,311	1.325	13,152,809	10,262,895	2,889,914	78.03	1,856,544	4,467,521	2,856,523
1927	1,825	1,605,891	121,832	1.314	12,959,440	10,745,287	2,214,153	82.91	1,214,511	4,909,977	1,133,872
1928	1,934	1,565,760	99,828	1.303	12,303,314	9,208,703	3,094,610	74.85	1,957,437	4,787,897	1,134,460
1929	2,003	1,709,142	91,959	1.237	12,230,275	9,234,641	2,995,635	75.51	1,774,618	3,422,827	799,693

NOTE: Figures showing Mileage, Revenue Ton-Miles, Revenue Passenger-Miles, Revenue per Ton-Mile (cents) and Net Charges for Additions and Betterments for the years 1923-1929 include also figures for affiliated companies.

### Fort Worth & Denver City

Year	Mileage	Revenue ton miles (thousands)	Revenue passenger miles (thousands)	Rev. per ton mile cents	Total operating revenues	Total operating expenses	Net operating revenues	Operating ratio	Net railway operating income	Net after charges	Net charges for additions and betterments
1920	454	598,260	143,932	1.409	11,196,885	10,383,618	813,267	87.58	1,476,050	1,476,050	1,446,741
1921	454	518,156	80,149	1.549	11,334,958	7,512,206	3,822,752	66.27	2,991,546	2,991,546	307,234
1922	456	461,673	66,111	1.484	9,717,038	6,725,890	2,991,147	69.22	2,004,272	2,004,272	1,856,795
1923	...	...	...	...	9,625,851	6,657,629	2,968,222	69.16	2,877,039	2,425,990	...
1924	...	...	...	...	11,170,306	6,669,357	4,470,950	59.97	3,832,662	3,408,935	...
1925	...	...	...	...	11,504,381	7,155,031	4,349,350	62.19	3,521,773	3,215,424	...
1926	...	...	...	...	13,298,548	7,835,313	5,463,235	58.92	4,368,463	4,139,628	...
1927	...	...	...	...	12,362,993	8,423,175	3,939,819	68.13	3,212,882	2,985,042	...
1928	...	...	...	...	11,601,560	7,219,593	4,381,967	62.23	3,651,576	3,062,370	...
1929	...	...	...	...	12,396,410	7,914,342	4,482,069	63.84	3,503,073	2,728,136	...

NOTE: Mileage, Revenue Ton-Miles, Revenue Passenger-Miles, Revenue per Ton-Mile (cents), and Net Charges to Additions and Betterments for years 1923 to 1929 are included in figures shown for Colorado & Southern.

of all the live stock received at these markets was brought in by truck.

"The continuing development of hard roads and the consequent increase in highway traffic accounts for the decrease in passenger revenue. The revenue from Chicago suburban traffic increased 1.79 per cent, with substantially the same increase in suburban train miles. Exclusive of suburban traffic there were carried 233,233 less revenue passengers than in 1928, a decrease of 4.23 per cent, and the passenger revenue miles decreased 15,783,935, or 2.66 per cent; the figures indicating the decrease to have been principally in short haul traffic.

pended in the preceding year. As shown in Table III, in the ten-year period, 1920-29, a total of more than 112 million dollars was expended for capital purposes; for the most part uncanceled. Major projects for improvement carried on in 1929 include: Terminal improvements at Chicago; additional main tracks at several points; four new stations; additions to grain elevators; an extensive program of bridge renewal and improvement; 28.9 track miles of automatic signals; a new interlocking plant and an installation of centralized signal and switch control; 339 miles of new rail. Equipment acquisitions were extensive. Six 2-10-4 freight

locomotives, one gas-electric locomotive and four rail motor cars were received from builders during the year while 12 Pacific type and eight 4-8-4 locomotives, 10 rail motor cars and 500 freight cars were ordered for 1930 delivery. In addition, 20 all-steel suburban cars, one dynamometer car and 1,621 freight cars were built in company shops and 2,029 freight cars, 14 suburban cars, 10 baggage cars and 50 cabooses were ordered from company shops for 1930 delivery. In 1929 fifteen Prairie type locomotives were converted into 0-6-0 switching locomotives in company shops with an additional 20 authorized for such conversion in 1930. An extensive program of equipment modernization by the application of new and improved devices and structural parts was continued.

The company is alert regarding its relationship to the economic well-being of the territory it serves and in 1929 established a new office, manager of commercial development, to carry on the industrial exploitation of the natural resources of its territory. Similarly, in agriculture, it follows closely the fortunes of its patrons, promoting settlement along its lines and endeavoring to increase the profitability of their operations. Its policy in these matters, together with its strong financial position and its liberal program of capital expenditures to improve its service and efficiency, assure its future, except from those evils beyond managerial control to which all railways are subject—subsidized competition by other methods of transport, which could not compete if they were forced to pay all their costs as the railroads are, and a short-sighted and parsimonious regulatory policy.

\* \* \*



From the St. Gothard Line of the Swiss Federal Railways, Showing the Village of Amsteg, the Bristenstock, and a Railway Power Station

## Looking Backward

### One Hundred Years Ago

The Liverpool & Manchester, in England, the first railroad to operate entirely by steam power in regular service, was opened on September 15, 1830.

Cooper's "Tom Thumb" locomotive, built in America for experimental purposes, was tested on the Baltimore & Ohio on a 26-mile round trip run between Baltimore and Ellicott Mills on August 28, 1830. This trip demonstrated the practicability of the steam locomotive.

### Fifty Years Ago

The race between the Chicago, Burlington & Quincy and the Wabash, St. Louis & Pacific [now the Wabash] for first possession of the route on which they propose to build across southern Iowa is quite exciting. It is stated that the Burlington has been so located as to cross the Wabash's proposed extension [the Missouri, Iowa & Nebraska] no less than 12 times in seven miles.—*Railway Age*, September 30, 1880.

The official report of the losses by the railway riots at Pittsburgh, Pa., in July, 1877, show that the total claims for damages filed by the seven railroads and the Pullman company totaled \$2,790,000. These were compromised at \$1,689,000. Of railroad rolling stock there were wholly or partially damaged, 107 locomotives, 72 passenger train cars and 2,071 freight train cars.—*Railway Age*, September 30, 1880.

### Twenty-Five Years Ago

T. M. Schumacher has resigned as traffic manager of the Oregon Short Line to become traffic manager of the United States Fruit Company at New York.—*Railway Age*, September 29, 1905.

The United States circuit court at Dallas, Tex., has granted an injunction asked by eight railroads restraining the Texas Railroad Commission from enforcing its emergency dry goods rate reduction from Galveston to interior Texas points. The Texas commission, upon learning that the railroads were charging on dry goods from Galveston a rail proportion of a through rate from New York which was higher than the commission's carload rate in Texas, immediately ordered the rates to be lowered. The roads opposed this order on the ground that the traffic is interstate.—*Railway Age*, September 29, 1905.

### Ten Years Ago

The improvement in transportation conditions which has been made in recent months is indicated by the fact in the week ending September 10 the accumulations of loaded freight cars awaiting movement at various points amounted to only 50,737. A few months ago the accumulations of cars were abnormally large. Now they are just about normal. Car loading continues to show increases over the corresponding weeks of 1918 and 1919.—*Railway Age*, September 24, 1920.

The Interstate Commerce Commission on September 17 gave its first official and public recognition of the improvement in transportation conditions in an announcement of the suspension until further notice of its order which gave preference in car supply and transportation for the shipment of 1,250,000 tons of coal monthly to New England, through tide-water ports from Hampton Roads, Va., to New York. The order had recently been suspended for a period of five days, following its original enactment on July 26.—*Railway Age*, September 24, 1920.



## Communications and Books

### A Lower Rate Would Attract the Business

DES MOINES, IOWA.

TO THE EDITOR:

Your editorial in your issue of August 30 in regard to loss of passenger earnings reflects a true situation and your prediction with reference to the future decline of this revenue is no doubt quite accurate.

The various methods to hold passenger traffic to the railroads which have been adopted during the past three years have been ineffectual and I doubt very much if some of these plans have been the means of deriving revenue over and above that which would have been received had such measures not been carried out. The so-called popular-rate excursion over weekends and holidays is particularly referred to and I herewith cite a specific example which I believe demonstrates that additional revenue is not gained through this means of attracting travel by rail. An excursion was recently operated from "A" to "B" on which were handled 294 passengers, the total revenue amounting to \$2,352.00. The out-of-pocket cost to operate this train amounted to \$1,261.13, leaving a balance of \$1,090.87. It is quite true that the reduced rate attracted a large number of people to make this trip, who under ordinary conditions would not have done so; yet it is reasonable to assume that many of these passengers would have made the trip at the regular tariff rate, but waited for the opportunity to take advantage of the reduced rate.

In order to compete with the rates offered by motor coach lines, the railroads between two principal cities in the middle west, namely, Kansas City and Denver, have established a coach rate of \$13.50 one way, which is slightly in excess of two cents per mile via the shortest route. This plan is meeting with a marked degree of success and travel between these two points has been quite heavy this summer, due no doubt to this reduced rate being in effect; however, it would seem that it would be practicable to allow this rate to apply to sleeping car passengers, in that the surcharge would provide additional revenue for the railroads and would provide a greater opportunity to fulfill the guarantee on sleeping cars operated.

The maximum rate which can be applied to railroad tickets either inter-state or intra-state is three and six-tenths cents per mile. Lower rates can be made effective by filing tariffs to do so but the above-mentioned rate cannot be exceeded. The creation of lower rates by the motor coaches has divided the traveling public into distinct classes, but it can also be said that the principal attraction to motor coach travel, especially those motor coaches which operate directly competitive to through trans-continental trains, is the lower tariff.

If the passenger tariff would be reduced to two cents per mile both inter-state and intra-state, it is my firm belief that three people would ride a railroad train where at the present time but one passenger rides. For instance, the distance from "A" to "B" is 357 miles and the regular fare now is \$12.89. At a rate of two cents per mile, the fare would be \$7.14. Two bus lines now operate between these two points, the rate being \$8.00 one way or \$14.40 a round trip, the latter being good for 60 days. Surely the reduced railroad fare would be far more attractive to passengers who now would use the motor coach. A motor coach ride under the best conditions which now prevail is not as comfortable as a railroad day coach or chair car, nor in a majority of cases do the motor coaches make as good time as the trains, but there are thousands of people who through necessity and lack of funds are willing and must sacrifice their personal comfort in order to get from one point to another.

It is a rare thing nowadays to see a well-filled day coach or chair car. The railroads have the facilities and equipment to enjoy a larger passenger revenue with practically no increased cost to do so. A reduction to two cents per mile would also

obviate the necessity of running popular rate excursions and also at two cents per mile a good many people would buy railroad tickets rather than drive their own automobile a distance of two hundred miles or more and, really, the privately-owned automobile has been the chief factor in the steady decline of passenger revenue.

D. BERMAN,  
Secretary to General Manager,  
Chicago, Rock Island & Pacific Ry.

### Books and Articles of Special Interest to Railroaders

(Compiled by Elizabeth Cullen, Reference Librarian,  
Bureau of Railway Economics, Washington, D. C.)

#### Books and Pamphlets

*Commerce Yearbook 1930 (Eighth Number)—Volume I—United States*, compiled by U. S. Bureau of Foreign and Domestic Commerce. Chapter XIX "Transportation and Communication" p. 562-614 has statistics for 1929 and several preceding years on railroad operations, finance, average receipts per ton-mile, etc. The note on comparative world statistics, p. 573, may be of interest. 678 p. Pub. by U. S. Govt. Print. Off., Washington, D. C. \$1.

*Railroad Valuation and Fair Return*, by Shao-Tseng Wu, with Foreword by Dean Emory R. Johnson. "A study of the basis, rate, and related problems of fair return for American railroads." "While the author does not pretend to have said a final word on the subject, it is to be hoped that his humble effort may help to stimulate interest in, and further the understanding of, this important problem . . . a complex problem about which opinions are much at variance." p. xiv. Part I "Basis of Return" takes up fair value for rate-making purposes, original cost and cost of reproduction, and depreciation, intangible values, and the future rate base; Part II "The Rate of Return" discusses economic analysis of fair return, criteria of a fair rate of return, and the statutory rate of return for steam railroads; Part III "Related Problems" considers recapture of excess income, equalization of railroad earnings, and railroad financial return since 1920. 233 p. Pub. by University of Pennsylvania Press, Philadelphia, Penna., \$3.

*The Seven Wonders of Southern Africa*, by Hedley A. Chilvers. Chapter XIX "The Story of the Railways in Southern Africa" discusses the inception, construction, and recent development of the lines. "Rhodes envisaged an all-red Cape-Cairo route north . . . but the discovery of big mineral deposits around Katanga to the west of the route drew the line away from it into the Belgian Congo, and Rhodes' dream has not yet materialized." p. 288. Illustrated, partly in color. 386 p. "Published by Authority of the Administration of the South African Railways and Harbours." Johannesburg. Available in this country from the New York office of the South African Railways and Harbours.

#### Periodical Articles

*Do Lower Rail Rates Promote Prosperity?* by Lee G. Lauck. "The history of the past eight years demonstrates that to base freight rates upon prices which fluctuate constantly would be to base them on shifting sand. They should be, and are, made roughly in proportion to the value of commodities . . ." Includes chart "Index numbers of freight rates, wholesale prices of all commodities and farm prices" 1910-1930. 1900-1909 equals 100%. Barron's, September 22, 1930, p. 6.

*Railroading Today—Construction and Maintenance*, by F. X. Milholland. Modern methods described. Scientific American, September 1930, p. 169-173.

# Odds and Ends of Railroading

## No-Hit Pitchers

The Boston & Maine should be a fertile hunting-ground for major league scouts. James F. Hall, car man helper, and James Dooling, clerk in the engineering department, have both pitched no-hit games for B. & M. teams this season.

## Comiskey Honored

Whoever named the stations on the Missouri Pacific, between Council Grove, Kan., and Hoisington, was evidently a baseball fan. Headed by Comiskey, Kan., each member of Charles Comiskey's old-time White Sox team is honored by having a station named after him.

## Bee Yourself

It sometimes pays to have a hobby, as witness Arthur Quinley Anvers, railway signalman at Amersham, England. A swarm of bees recently took possession of a passenger train at that point, settled thickly in practically every compartment, routing passengers and trainmen alike. Pandemonium reigned. Then up strode Arthur, who is an amateur bee-keeper, and, with a wave of his hand, or a lump of sugar, induced the bees to leave the train and enter one of his hives.

## A Tie Salesman

The following letter, on which comment seems unnecessary, was received by the purchasing department of an eastern railway:

"dear company i am writing yo Replying to cypriss cross ties i has got a great Deal off cypriss ties and i wont to no what will you all allou ve me to load them and ship them to you all what are you all paying by the wholesale for cypriss ties and let me no what kind of cypriss do yo all take and what kind are regeted as may have as menny as \$45 are \$50,000. for sale and i thought that you all could use some ties kindly send me the listies & prises if you all can use ene y ties."

## More About European Tunnels

Labor and blasting materials seem to have been extremely cheap when the European railways were built, judging by the number and length of the tunnels to be found whenever the lines cross hilly country. In the mountains, the number of tunnels is amazing. In fact, the original builders seem almost to have preferred to locate as much of the lines underground as possible. It is noticeable, however, that, where second main track was built, at a considerably later period, tunnels were avoided. Apparently, boring costs had increased a great deal. This is particularly noticeable on the main line between Vienna and Paris, in the Austrian Tyrol section. At first, the natural conclusion was that the track which avoided the tunnels was the first one built, and the tunnels were necessary on the additional track because of lack of room. Inquiry, however, developed that this was not the case.

## Freight Service Many Times

### Cheaper Than in Early Days

In the early days shippers frequently paid many times as much as they do today for railway freight service and thought they were getting a bargain at that.

In 1848, for instance, two Mississippi railroads now belonging to the Illinois Central received 24.3 cents for moving the average ton of first-class freight one mile and 17.3 cents for moving the average ton of second-class freight one mile. Last year the average amount collected by the Illinois Central for moving a ton of freight one mile was 0.93 cent, or less than one-eighteenth the lowest rate charged by the Mississippi roads in 1848.

If the second-class rate of the Mississippi railroads in 1848 had been the prevailing rate on the Illinois Central last year,

this system's freight revenue would have amounted to \$2,695,000,000. Instead it amounted to less than 5½ per cent of that sum, or \$146,000,000.

## Those Early Sleeping Cars

A graphic description of one of the very early sleeping cars is found in a railway manual published in 1865. The writer said:

"Within a year I have seen the oldest and the newest sleeping coaches, the remote past and the near future of railway travel at night. What a contrast the two present! The early sleeping car was low and narrow, and dark and stuffy. It wobbled and creaked and moved in all directions like a ship's compass. It had little windows that you could look out of only by bending double, and a narrow passage walled in by iron rods, one reaching to the roof from the back of every seat. On these poles the upper berths were hitched till they were ready for bedtime. The lower berths were narrow and so short that you had to lie in one like a half-opened pocket-knife with your knees in the air and the bed clothes pushed up like a tent. You did not need to be pious in order to thank Heaven when you got out of that car."

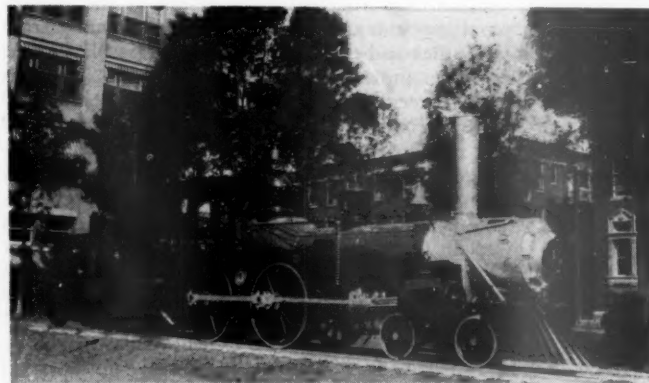
## Another Champion

Along with the new records established this year for endurance flights, tree sitting, home runs and other activity comes word of a new champion among railroad section foremen. John Bork of Grafton, Iowa, who has been in the employ of the Chicago, Milwaukee, St. Paul & Pacific for the past 45 years, has never suffered an injury of any kind, notwithstanding the hardships of the early days of railroading. During the 30 years that he has been a foreman, none of the employees under his supervision have been injured. Mr. Bork is the father of 16 living children. Three of his sons are employed with him on the Milwaukee road.

Running a close second is Jacob Teske, who has worked 29 years for the Milwaukee, 27 years as a section foreman, without an injury of any kind to himself or his men. Two sons, Jacob J., 14 years service, with 5 years as a section foreman, and Theodore, 14 years service, of which 4 are as a section foreman, have carried on the family tradition of no injuries. A third son, Edward, has six years service in his father's gang.

## An Interesting Relic

One of the sights of El Paso, Texas, is the locomotive shown in the illustration. It is the first locomotive owned by the El Paso & South Western (now Southern Pacific). It was in service from 1887 to 1909, and is now enjoying a peaceful and honorable old age in the park adjoining the S. P. general office building at El Paso.



The Original E. P. & S. W. Locomotive



# NEWS

## Rehearing on Extension of Sacramento Northern *I.C.C. objection to project met by reduction in estimates of cost*

The chief objection to the construction of an extension of the Holland branch of the Sacramento Northern to Ryde, 8.3 miles, in Yolo county, Cal., as stated by the Interstate Commerce Commission in denying the railroad's application, has been met by a reduction in the estimate of proposed expenditure, it was shown at a hearing before A. T. Sullivan, commission examiner, at San Francisco, Cal., on September 8 and 9. The original estimate of the cost of construction, \$1,062,000, has been reduced to \$735,000, through the consent of farmers to accept a lower price for right of way through their lands, and the willingness of Sacramento and Yolo counties to bear half the cost of a bridge over Steamboat slough. The commission denied the application on July 1, 1929, on the ground that a capital expenditure of more than \$1,000,000 was not warranted.

At the rehearing, growers and shippers said that they are unable to market their produce in the best of condition because of a lack of rail facilities. Witnesses for the Southern Pacific, which opposes the extension, maintained that the Sacramento Northern has underestimated the cost of construction. It was also declared by witnesses for the Southern Pacific that the needs of shippers are amply served by existing facilities, and will be more adequately served through the reduction in schedule time of perishables upon completion of its bridge over Carquinez straits.

### Freight Claim Payments Increase

Freight claim payments, as reported by 175 railroads of the United States and Canada, to the Freight Claim Division of the A.R.A., show an increase of \$764,862 during the first six months of 1930 as compared with the corresponding period of 1929, or from \$18,510,037 to \$19,274,899. The increase in fresh fruits, melons and vegetables is \$966,911. By grouping these commodities into four parts, citrus fruits, other than citrus fruits, melons and vegetables, the Freight Claim Division is able to analyze the reports of the carriers more accurately. During the first half of 1930, 94.2 per cent of this increase is chargeable to vegetables.

### Reduced Fares on Motor Trains

The Baltimore & Ohio has filed with the Interstate Commerce Commission a passenger tariff, effective October 15, showing passenger rates on two specified "motor trains" from and to points on its line between Indianapolis, Ind., and Decatur, Ill., on a basis of about 55 per cent of the regular passenger fares. The through fare on the regular trains between Indianapolis and Decatur is \$5.51 and the fare on the two specified trains is to be \$3.06; and corresponding rates are published between the 41 intermediate stations.

## Outlay for Safety Work \$298,000,000 in 1929 *Class I roads spent this sum for protection of employees and the public*

The Class I railroads spent \$298,000,000 in 1929 for the improvement of safety and protection of employees and the general public, according to a statement submitted by the American Railway Association to the Interstate Commerce Commission. Of the total, \$193,808,132 represented capital expenditures made for the improvement of safety and protection; \$94,790,334 represented the cost of operating signals, protecting crossings and expenses of safety organizations, and \$9,000,000 was spent for a wide variety of other purposes designed to bring about increased safety.

For installation of block signals, two-way operation on main tracks, and central controlled dispatcher systems, \$24,618,181 was spent in 1929. A total of \$2,497,829 was spent for the installation of automatic train control and cab signals and \$40,284,186 for the construction of additional tracks. Of that sum, \$33,226,140 was expended for additional main line track.

The railroads also spent \$28,445,680 for the protection or elimination of highway grade crossings; and for automatic warning devices, gates, signals and signs, \$2,742,401 was expended. There was also paid out \$37,761,027 for heavier rail; \$29,720,314 for steel passenger train cars, and \$8,693,586 for reduction of grades and curvature.

## Railways Ask Rehearing of Western Grain Case *Assert that revenues, already below fair return, will be further reduced*

Railroads in southeastern and Carolina territory and the Mississippi valley have filed with the Interstate Commerce Commission petitions asking for a rehearing on its decision in the western grain rate case in so far as it involves rates to New Orleans and Mississippi valley territory. Both petitions assert that the effect of the decision will be to reduce revenues which are not yet producing the fair return contemplated by the transportation act and that the lines are in no condition to stand any reduction in their present level of rates on grain or any other commodity unless at the same time corresponding increases are made on other commodities. The southeastern and Carolina lines assert that if rates to the entire Mississippi valley and the Southeast and Carolina territories should be made effective on a level with the rates prescribed from St. Louis and Memphis to New Orleans the annual revenue of the southern lines from grain and grain products will be reduced from \$28,000,000 to \$14,000,000 a year and that "instead of making substantial reductions the problem is to find commodities which can stand increases and still move freely." If these reductions are to be made, they say, the roads must make still further retrenchments and they ask that the prescribed rates to New Orleans and the Mississippi valley be eliminated as outside the scope of the western case.

The Mississippi Valley lines declared that "it is not too much to say that a crisis confronts the carriers in southern territory as a result of the decision in this proceeding, coming as it does at a time when these carriers are striving to operate under greatly diminished revenues, revenues that at the present time are wholly inadequate." They say the reductions prescribed from St. Louis and Memphis range from 22 to 41 per cent.

### Railway Club Meetings

The Car Foremen's Association of Chicago will hold its annual entertainment and dance at the Morrison Hotel, Chicago, on Monday evening, October 13.

The Car Foremen's Association of Omaha will hold its next meeting on Thursday, October 9, at 2 p.m. in the





tools, expenditures totaled \$15,888,000. For station facilities and office buildings, capital expenditures amounted to \$47,641,000. Bridges, trestles and culverts absorbed \$28,975,000. For additional ballast, \$6,151,000 were expended, while for signals and interlockers, including telegraph and telephone lines, automatic train control and other signal devices, \$20,023,000 were expended. For all other improvements, \$80,574,000 was expended in the first six months of this year.

### New S. A. L. Train

The Seaboard Air Line announces a new train between Portsmouth, Va., and Norlina, N. C., by which Norfolk and Portsmouth will have the benefit of the fast service of the Southern States Special. The time between Portsmouth and southern cities will be reduced about four hours. The new train leaves Portsmouth at 4 p.m. and northbound arrives at 12:40 p.m.

### Rules for Transportation of Explosives

As heretofore announced, the recently revised regulations for the transportation of explosives and other dangerous articles, as issued by the Interstate Commerce Commission, go into effect on October 1; and already the Bureau of Explosives has prepared a docket, filling 17 pages, of proposed changes in the rules. These proposals are presented by request of makers of explosives and of paints; celluloid manufacturers and chemists, and makers of containers. The Bureau itself will propose numerous changes, to correct clerical and other errors now existing in the regulations. The Bureau has appointed a conference to be held October 6, at its office, 30 Vesey Street, New York City, and recommendations settled upon there will be referred to the Interstate Commerce Commission. The Bureau hopes to hold conferences as often as may be necessary, but not oftener than once in four months.

### Master Blacksmiths Meet at Chicago

The thirty-fourth annual convention of the International Railroad Master Blacksmiths' Association was held at the Morrison hotel, Chicago, September 23 to 25, inclusive. The convention this year was held at a later date than usual in order to give the members of the association an opportunity to visit the exhibits of the National Metals Congress which was held during the past week at the Stevens hotel, Chicago. At the opening session, there was a brief address by Robert E. Guthrie, president of the American Society of Steel Treating, in which an invitation was extended to the Blacksmiths' Association to take advantage of the facilities of the Metals Congress exposition and meeting. Another address was that delivered by R. H. Turnbull, assistant superintendent of motive power, Atlantic Coast Line, who expressed satisfaction that it was possible for the association to meet at this particular time in order that the mem-

bers might take advantage of the meetings with other organizations that were being held in Chicago during the past week. Mr. Turnbull pointed out that materials and methods are changing so rapidly in railroad work that it is necessary for one to keep abreast of the times by constant contact with fellow craftsmen. Several reports on autogenous welding were presented at the opening session of the convention and the discussion of these reports resolved itself into the merits of the reconstruction of locomotive rods by different methods of welding.

In addition to the above mentioned report, there were reports presented at later sessions on the subjects of heat treatment of steel, machine forging, spring making, and reclamation.

### U. S. Chamber of Commerce Appoints Transportation Committees

The Chamber of Commerce of the United States has announced the appointment of the members of its standing Transportation and Communication Department Committee which is to guide the chamber's activities during the coming year in the broad field of transportation and communication. Besides its general functions the department committee will give special attention to such subjects as street and highway traffic, merchant marine, postal affairs and traffic and transportation bureaus, while for specialized study of certain other problems the committee has recommended and the board of directors has approved the appointment of special committees to cover railroad transportation, inland waterway transportation, highways and motor transport and commercial aeronautics. The department committee is as follows:

Fred W. Sargent, chairman, president, Chicago & North Western, Chicago; A. W. Robertson, vice chairman, chairman of the board, Westinghouse Electric & Manufacturing Company, Pittsburgh, Pa.; George H. Baldwin, executive vice president, Bisbee-Baldwin Corporation, Jacksonville, Fla.; A. J. Brosseau, president, Mack Trucks, New York City; W. Irving Bullard, vice-president, Central Trust Company, of Illinois, Chicago; W. W. Cloud, president, Yellow Cab Company, Baltimore, Md.; W. C. Cowling, traffic manager, Ford Motor Company, Dearborn, Mich.; General J. G. Harbord, chairman of the board, Radio Corporation of America, New York City; A. L. Humphrey, president, Westinghouse Air Brake Company, Pittsburgh, Pa.; Roger D. Lapham, president American-Hawaiian Steamship Company, San Francisco, Cal.; J. N. Shannahan, president Omaha & Council Bluffs Street Railway, Omaha, Neb.; A. R. Smith, vice-president, Louisville & Nashville, Louisville, Ky.; Lucius Teter, chairman of the board, Chicago Trust Company, Chicago; H. B. Walker, president, American Steamship Owners' Association, New York; Eugene S. Wilson, vice-president American Telephone & Telegraph Company, New York.

The committee on railroads, which held its first meeting on September 18, and which is to give attention to such subjects as the Howell bill and railway legislation generally, is as follows:

F. C. Dillard, chairman, attorney, Sherman, Tex.; William H. Chandler, manager Traffic Bureau, The Merchants' Association, New York; A. R. Currie, vice-president, Ryan Fruit Company, Seattle, Wash.; Wierpont V. Davis, vice-president, The National City Company, New York City; William J. Dean, president, Nicols, Dean & Gregg, St. Paul, Minn.; Samuel O. Dunn, editor, Railway Age, Chicago; R. C. Fulbright, Fulbright, Crooker and Freeman, Washington, D. C. (Houston, Texas); A. L. Humphrey, president Westinghouse Air Brake Company,

Pittsburgh, Pa.; Dr. Emory R. Johnson, dean, Wharton School of Finance and Commerce, University of Pennsylvania, Philadelphia, Pa.; C. W. Lonsdale, president Simonds-Shields-Lonsdale Grain Company, Kansas City, Mo.; J. F. Reed, Minneapolis, Minn.

The special committee on inland waterway transportation held its first meeting on September 19, giving attention to the following subjects:

Standards or tests which should apply in determining the advisability of public expenditures for waterway improvement; principles to apply in establishing rail and water routes and rates; principles to apply in transfer of government-owned barge lines to private ownership. The members are:

H. I. Harriman, chairman, chairman of the board, New England Power Association, Boston, Mass.; Harry A. Black, president, Black Hardware Company, Galveston, Tex.; W. C. Cowling, traffic manager, Ford Motor Company, Detroit, Mich.; Marshall N. Dana, editor, Portland Journal, Portland, Oregon; George S. Davison, president, Davison Coke & Iron Company, Pittsburgh, Pa.; W. R. Dawes, vice-president, Central Trust Co. of Illinois, Chicago; S. O. Dunn, editor, Railway Age, Chicago; Jens P. Jensen, professor of economics, University of Kansas, Lawrence, Kan.; B. F. Peek, vice-president, Deere & Company, Moline, Ill.; Albert L. Reed, Callaway & Reed, Dallas, Tex.; M. J. Sanders, Leyland Lines, New Orleans, La.; Fred W. Sargent, president, Chicago & North Western, Chicago; A. R. Smith, vice-president, Louisville & Nashville, Louisville, Ky.; T. G. Woolford, president, Retail Credit Company, Atlanta, Ga.

### Hoch-Smith Hearing on Salt Rates

The Interstate Commerce Commission opened its first hearing on salt rates under the Hoch-Smith resolution at Chicago on September 22. On the first day of the hearing railroads introduced witnesses to show that the salt rates are below a reasonable level and that Michigan and Ohio producers are favored, while Kansas shippers and others in the west are discriminated against.

### New England Shippers' Board

The New England Shippers' Advisory Board held its regular meeting at Maplewood, N. H., on September 19. The amount of freight expected in the last three months of this year is 1.2 per cent less than the actual movement in the same quarter of 1929. This is the weighted average, made up from the reports of all the commodity committees. The most numerous conclusions of the committees are those which say "no change," which apply to boots, shoes and leather, canned goods, gravel and sand, cotton and cotton products, dairy products, fertilizer, hay and scrap metals.

The notable increases predicted are cement, 7 per cent; coal and coke, 10 per cent; grains, 10 per cent; hardware, 10 per cent; petroleum, etc., 75 to 20 per cent and woolen goods, 10 per cent.

Decreases expected are: building and monumental stone, 10 to 20 per cent; brick and tile, 20 per cent; electrical machinery, 10 to 20 per cent; furniture, 15 per cent; iron and steel, 10 to 15 per cent; lime, 10 per cent; live stock, 10 per cent; lumber, etc., 10 to 15 per cent; machinery, 30 to 35 per cent; slate, 15 to 20 per cent; sugar, 10 to 15 per cent.

Among the speakers at the meeting were A. T. Lane, Great Northern Paper Company; F. E. Windburn, freight claim division, A. R. A.; Charles E. Spencer,

Jr., First National Bank of Boston and Eric Englund, Department of Agriculture, Washington.

### Will Not Contest Western Class Rate Decision

Kansas, North Dakota, South Dakota and Missouri will refrain from joining Minnesota and Iowa in contesting the decision of the Interstate Commerce Commission in docket No. 17,000, part 2, western trunk lines class rates, according to statements made by the various state commissions. The Missouri Public Service Commission has issued an order establishing a new level of intrastate freight rates conforming to the basis prescribed by the Federal Commission for interstate rates. Following this action members of the public service commissions in the western territory met at Kansas City on September 25 to discuss the grain rates which have been ordered into effect on January 1 by the Interstate Commerce Commission.

### Atlantic States Advisory Board

The Atlantic States Shippers' Advisory Board met at Schenectady, N. Y., on September 26. The estimated requirements of cars to move freight in this territory in the three months beginning October 1 aggregate 953,945 cars, which is 4.1 per cent more than the actual number of cars used during the same quarter last year. The majority of the commodity reports predict decreases, the net increase being due principally to anticipated increases in the movement of anthracite coal.

Improvements expected over last year include coal (anthracite) 9.5 per cent; coke, 5.1 per cent; crushed stone, 5 per cent; electrical machinery and appliances, 12; fresh fruits and vegetables, 12 to 15; flour, 9.8; petroleum, 6, and sugar, 13.5 per cent. There will probably be a falling off in auto parts and accessories of 5 per cent; of castings, machinery and boilers, 15 per cent, brass, copper and bronze, 19; brick, 15; clay and clay products, 10.8; canned foods, 10; cement, 10 and dairy and dairy products, 5 per cent.

Ore is expected to fall off 11 per cent; roofing material 19.7, paints 22, slate 15, and salt 13 per cent. In iron, steel and lumber, no change is anticipated. In l.c.l. freight the large cities report probable decreases of from 10 per cent down to zero.

The meeting was addressed by B. L. DeLack, works manager of the General Electric Company, and by numerous shippers and railroad representatives.

### Equipment Installed

Class I railroads of the United States in the first eight months of 1930 placed 64,418 new freight cars in service, the Car Service Division of the American Railway Association has announced. In the same period last year, 51,680 new freight cars were placed in service.

Of the total 33,135 were box cars, an increase of 8,409 compared with such installations in the first eight months of 1929. There were also 24,380 new coal

cars as compared with 18,136 installed during the same period last year. In addition, the railroads in the eight months period this year installed 3,225 flat cars, 2,650 refrigerator cars; 727 stock cars, and 301 other miscellaneous cars. The railroads on September 1 this year had 12,166 new freight cars on order compared with 31,898 cars on the same day last year and 9,257 on the same day two years ago.

The railroads also placed in service in the first eight months this year 561 new locomotives compared with 474 in the same period in 1929. New locomotives on order on September 1 this year totaled 235 compared with 395 on the same day last year. Freight cars or locomotives leased or otherwise acquired are not included in the above figures.

### S. P. Cuts Train Time

The Southern Pacific's "Gold Coast Limited," between Chicago and the Pacific Coast, over the C. & N. W., the U. P. and the S. P., is to be run through in five hours, 30 minutes less time than at present; and the "Pacific Limited," westbound, will be quickened 45 minutes and eastbound one hour.

### Railway Fire Protection Association

The Railway Fire Protection Association will hold its annual meeting at the Statler Hotel, St. Louis, Mo., on October 21, 22 and 23. The following program has been outlined for the meeting:

#### Tuesday Morning

Address by Hon. X. P. Wilfley

#### Tuesday Afternoon

Reports of committees

Paper—"Depression of Business and How it Affects Fire Prevention," F. R. Pradford, Boston & Maine.

Report of Committee on Fire Losses in Rolling Stock

#### Wednesday Morning

Report of Hand Book committee; proposed changes.

#### Wednesday Afternoon

Continuation of report of Hand Book committee. (It is expected that the discussion of changes will take one full day and take the place of the usual open discussion of field practice.)

#### Thursday Morning

Report of Committee on Incinerators

Reports of members representing the association on committees of the National Fire Protection Association, the American Railway Association, the American Railway Engineering Association and other national organizations.

### Sweetbreads by the Car Load

Seventeen degrees below the freezing point was the interior temperature of a refrigerator car recently prepared by the New York Central at New York City for a shipment to be carried to Indianapolis, Ind. This pre-cooling required 48 hours. The car was for 20 tons of pancreas which arrived on the steamship Eastern Prince from Buenos Aires. These glands, used to make insulin, a medicine for diabetes, are so highly perishable that ordinarily no attempt is made to transport them long distances. This lot was kept on the steamship at a temperature of five degrees below zero. In moving them by rail, the car is kept cold by the use of dry ice. A two months' process for converting the raw material into in-

sulin must be completed before it will be known whether or not this experimental importation is a success.

### Car-Hire Settlement Order Postponed

At the request of Judge Charles E. Woodward of the United States district court for the northern district of Illinois, in which suit has been filed by railways to enjoin the order of the Interstate Commerce Commission of July 15 requiring modifications of the rules for car-hire settlement, the commission has postponed the effective date of the order from October 1 to December 1.

### New York-Washington Air Travel

Amelia Earhart, vice-president of the "New York, Philadelphia and Washington Airways" reports that the airplanes of that line, in the week ending September 21, carried 1,202 passengers. These planes leave Newark, N. J., for Washington each hour from 8 a.m. to 5 p.m. and leave Washington northward at the same hour. Stops are made at Camden, N. J., (for Philadelphia, Pa.). It is proposed to increase the service and to have landings at Trenton, N. J., Wilmington, Del., and Baltimore, Md.

### Canadian Pacific Branch Lines Opened

The Canadian Pacific will inaugurate passenger service into Prince Albert, Sask., on September 30 over its recently completed line north from Lanigan. There will be daily coach and sleeping car service with a train leaving Regina, Sask., at 11:35 p.m. and arriving at Prince Albert at 9 a.m. Returning, the same service will be provided, leaving Prince Albert at 9 p.m. and arriving at Regina at 6 a.m.

With the completion of a connection between Coderre, Sask., the former terminus of the Swift Current-Coderre branch, and Archive, Sask., on the Moose Jaw-Assiniboia line, tri-weekly passenger service will be inaugurated between Swift Current, Sask., and Moose Jaw, via Coderre, on September 28. Improvement will also be made in the passenger service between Wilkie, Sask., and Edmonton, Alta., via Lloydminster, and in that between Sheho, Sask., and Nipawin, both of which now operate on a tri-weekly basis.

### General Foremen Elect Officers

The twenty-fifth or silver anniversary of the founding of the International Railway General Foreman's Association was celebrated at the annual fall convention in Chicago, September 16 to 19, inclusive. Included among the speakers were L. Richardson, chief mechanical officer, Boston & Maine; H. C. Stevens, general storkeeper, Wabash; C. L. Emmerson, master mechanic, Chicago, Milwaukee, St. Paul & Pacific, and E. Von Bergen, general air brake, lubricating and car heating engineer, Illinois Central. Three of the committee reports most fully discussed pertained to engine-truck main-



tenance, rail-car inspection and repair, and the better maintenance of passenger-car equipment. The total registration at the convention was 345, of whom 166 were railroad men and 131 supply men.

At the closing session, the following officers were elected for the ensuing year: President, A. H. Keys, general car foreman, Baltimore & Ohio, Pittsburgh, Pa.; first vice-president, A. T. Streeter, general foreman, Nickel Plate, Conneaut, Ohio; second vice-president, W. J. McClosky, general car foreman, Illinois Central, Centralia, Ill.; third vice-president, C. M. Hillman, shop superintendent, Minneapolis & St. Louis, Marshalltown, Iowa; fourth vice-president, Martin A. R. Slack, general foreman, New York, New Haven & Hartford, New York; secretary-treasurer, William Hall, Winona, Minn. The executive committee includes H. B. Sunderman, general foreman, Chesapeake & Ohio, Columbus, Ohio, chairman; J. H. Armstrong, general foreman, Atchinson, Topeka & Santa Fe, Topeka, Kan.; F. M. A'Hearn, assistant general foreman, Bessemer & Lake Erie, Greenville, Pa.; C. A. Barnes, general foreman, Belt Railway of Chicago, Chicago, and E. J. Burck, superintendent of shops, Michigan Central, Jackson, Mich.

### Club Cars for "The Hoosier"

The Chicago, Indianapolis & Louisville has added a club lounge car to the equipment of "The Hoosier" between Chicago and Indianapolis, Ind. The cars, which were built in the Monon car shop at Lafayette, have interiors designed in ivory and tan. They are lighted with ceiling lights, twin wall brackets and lamps on the end tables, while the furniture includes a radio.

### General Foremen's Exhibit

Forty-nine companies selling railway equipment and supplies were represented in the exhibition held in conjunction with the twenty-fifth annual convention of the International Railway General Foremen's Association at the Hotel Sherman, Chicago, September 16 to 19 inclusive. These companies are organized in a body known as the Association of Railway Supply Men, which elected the following officers for the year 1930-31: President, J. W. Fogg, MacLean-Fogg Lock Nut Company, Chicago; secretary-treasurer, J. F. Gettrust, Ashton Valve Company, Chicago; executive committee members: Chairman, E. H. Weaver, Westinghouse Air Brake Company, Chicago; Fred Ehredt, (one year) Nathan Manufacturing Company, Chicago; R. Q. Milnes, (two years) Dearborn Chemical Company, Chicago; P. J. Conrath, (three years) National Tube Company, Chicago; J. F. Raps, (three years) Okadee Company, Chicago. The companies represented in the exhibition, products on display and representatives in attendance were as follows:

Air Reduction Sales Company, New York.—Oxygen, acetylene, carbide, and welding cutting apparatus. Represented by R. T. Peabody, B. N. Law, Joe Kenefic, Harry Hocking and G. Van Alstyne.  
Armstrong-Blum Manufacturing Company, Chicago.—Ball-bearing high-speed hack-saw machines; metal band-saw machine and high-speed edge non-breakable hack-saw blades. Represented by H. J. Blum and G. M. Hess.

Ashton Valve Company, Cambridge, Mass.—Wheel-press recording gage; locomotive driving-wheel quartering gage, safety valves, steam and air gages, and whistles. Represented by E. C. Kenyon, C. Gaston and J. F. Gettrust.

Barco Manufacturing Company, Chicago.—Power reverse gear; low-water alarm; engine and tender metallic connection; car steam-heat metallic connection. Represented by C. T. Mellor and C. O. Jenista.

Buckeye Portable Tool Company, Dayton, Ohio.—Pneumatic drills, grinders, buffers, sanders, frame-jaw grinders; lapping tools, screw drivers and nut setters. Represented by W. R. Gummere, H. W. Leighton and W. W. Price.

Clark Manufacturing Company, Philadelphia, Pa.—Wheel pivot, pinion, gear and inner-race pulling device, piston parters, bridge jack, frame-bolt jack, hook and roller bar, spike-puller crow bar, cable and rod grip, locomotive connecting jack, fireman's hook, ratchet and wrench. Represented by H. J. Smith.

Crucible Steel Company of America, New York.—Tool steels. Represented by Fred Baskerfield, J. H. Jones and J. E. Covington.

Davis Boring Tool Company, St. Louis, Mo.—Car-wheel boring tools, cross-head taper reamers and driving-box boring bar. Represented by R. G. Kilzer and J. E. Kilzer.

Dearborn Chemical Company, Chicago.—Water treatment, water treating plants and rust preventive. Represented by G. R. Carr, C. M. Hoffman, L. P. Bowen, F. B. Horstmann, S. C. Johnson, R. Q. Milnes and H. B. Crocker.

Detroit Lubricator Company, Detroit, Mich.—Mechanical lubricators, oilfeed adjuster (automatic), flange oiler, high-pressure and low pressure terminal checks and hydrostatic lubricator and transfer filler. Represented by S. A. Witt, C. E. Sperry, E. F. Milbank, W. D. Knox and C. C. King.

Paul Dickinson, Inc., Chicago.—Ventilators; cast-iron caboose and camp-car smoke jacks, chimneys, roof drains and steam exhaust heads. Represented by A. J. Filkins, A. E. Engman and K. T. Batchelder.

Durametallic Corporation, Kalamazoo, Mich.—Metallic packing for all known temperatures, and tire machining apparatus. Represented by C. C. Hall and J. M. Bandish.

Eclipse Counterbore Company, Detroit, Mich.—Counterbores and core drills. Represented by S. D. Gafford and F. W. Dixon, Jr.

The Edna Brass Manufacturing Company, Cincinnati, Ohio.—Mechanical lubricators (working model and also sectional model); flange lubricator. Represented by H. A. Glenn, William Beck and F. S. Wilcoxon.

J. Faessler Manufacturing Company, Moberly, Mo.—Side and main-rod bushings and brasses. Represented by G. R. Maupin.

Fifth-Sterling Steel Company, Chicago.—Cutting tools. Represented by E. T. Jackman and C. E. Hughes.

The Flash Sales Corporation, Chicago.—Eifel Plierenck kit. Represented by L. M. Eifel.

Forster Paint & Manufacturing Co., Winona, Minn.—Literature. Represented by H. J. Caswell.

Foster-Johnson Reamer Company, Elkhart, Ind.—Expansion reamers and specialty tools. Represented by L. G. Groessl, C. B. Whitmyer and F. M. Enos.

Graham-White Sander Corporation, Roanoke, Va.—Sander and sand spreaders. Represented by W. H. White and F. H. Smith.

Grip Nut Company, Chicago.—Lock nuts. Represented by W. E. Sharp, J. H. Sharp, R. F. Repasz and L. W. Kass.

The Hanna Stoker Company, Cincinnati, Ohio. Stoker for locomotive. Represented by S. K. Witt.

Hunt-Spiller Manufacturing Corporation, Boston, Mass.—Piston heads and bull rings, duplex sectional cylinder packing, shoes, valve bushing, hub liners and gas-engine pistons and liners. Represented by V. W. Ellet, E. J. Fuller, F. W. Lampton and D. F. Hall.

The Joyce-Cridland Company, Dayton, Ohio.—Air-driven-motor jack hoists, ratchet jacks, journal jacks and track jacks. Represented by C. Huston Brown, C. L. Bunnell and O. H. Sneed.

Charles R. Long Jr., Company, Louisville, Ky.—Finished panels. Represented by C. R. Long, M. H. Oakes and C. M. Starke.

The Lehon Company, Chicago.—Locomotive cab curtain canvas. Represented by J. E. Eipper and H. A. Wolfe.

MacLean-Fogg Lock Nut Company, Chicago.—Water-tight bolts and lock nuts. Represented by J. W. Fogg and W. G. Wilcoxson.

Manning, Maxwell & Moore, Chicago.—Drop-pit table, manufactured by Shaw Crane Works. Represented by R. S. Dean, Frank Blake, A. J. Cote, F. J. La Pres and Walter Deem.

W. H. Miner, Inc., Chicago.—Draft gear and circulars of draft gear, side bearings, hand brake and yoke. Represented by B. S. Johnson, C. W. Woessner and A. G. Peterson.

Monarch Packing & Supply Company, Chicago.—Packings. Represented by C. C. Humberstone and S. MacDole.

Morton Manufacturing Company, Muskegon Heights, Mich.—Photographs of draw-cut shapers. Represented by G. F. Goble.

Nathan Manufacturing Company, New York.—Mechanical force-feed lubricators, low-water alarm, water column, gage cocks, water gages and hose strainer. Represented by Richard Welsh, C. J. Banning and Fred Ehredt.

National Malleable & Steel Castings Company, Cleveland, Ohio.—Draft gears, couplers, yokes, journal boxes, wrecking hooks, engine coupler pockets and steam-shovel chain. Represented by F. E. Moffett and T. W. Aishton.

National Tube Company, Pittsburgh, Pa.—Coiled steel pipe, seamless steel, lap welded—scale free; samples of hot-rolled seamless-steel boiler tubes. Represented by P. J. Conrath, R. W. Wire and J. W. Kelly.

The Niles Tool Works Company, Hamilton, Ohio.—Railroad tools. Represented by A. C. Wais, F. T. McDonough, J. Mullinex and B. A. Donahue.

Oakite Products, Inc., New York.—Cleaning materials. Represented by LeBaron B. Johnson and C. E. Barber.

The Ohio Injector Company, Chicago.—Mechanical lubricator, flange oiler, injectors, hydrostatic-lubricator transfer filler, low-water alarm, boiler check, fire jet and water-glass protector. Represented by Wm. Furry, Frank Edwards, A. C. Beckwith, F. B. Farnsworth, W. H. Malone and C. G. Sauerberg.

O. K. Tool Company, Inc., Chicago.—Lathe, planer and shaper tools, milling cutters, four-way tool posts and boring heads. Represented by Frederick Heatley and L. F. King.

Okadee Company, Chicago.—Blow-off valves, mufflers, tender-hose couplers, water-glass protectors, cylinder cocks, front-end hinge, blower valves, lubricators, drain valves and cylinder safety valve. Represented by A. G. Hollingshead, J. F. Raps, C. W. Ploen and I. W. Hebner.

The Oxweld Railroad Service Company, Chicago.—Oxyacetylene equipment and carbide inspection lights. Represented by F. C. Hasse, William Jones, William Leighton, O. F. Ladtkow, A. L. West, A. N. Lucas and J. J. Saclens.

Paxton-Mitchell Company, Omaha, Neb.—Metallic steam packing and cylinder-cock regulator. Represented by H. J. Molloy and J. J. Kelher.

The Pilliod Company, New York.—Locomotive valve gear. Represented by W. H. Bellmaine.

Pilot Packing Company, Chicago.—Asbestos products. Represented by R. N. Sinkler and Joseph Sinkler.

Reliance Machine & Stamping Works, Inc., New Orleans, La.—High-pressure grease appliances and grease gun. Represented by E. B. Norman and A. L. Dixon.

Simmons-Boardman Publishing Company, Chicago.—Copies of *Railway Age* and *Railway Mechanical Engineer*. Represented by Charles Packard, H. E. McCandless, H. A. Morrison and E. L. Woodward.

The Swanson Company, Chicago.—Gage holder. Represented by O. W. Swanson.

T-Z Railway Equipment Company, Chicago.—Metallic piston and valve-stem packing; blow-off valves, mufflers and locking devices; blower nozzles, smoke preventer nozzles, drain valves, tank hose couplers and strainers, boiler wash-out and arch-tube plugs, locomotive cylinder cocks, air-brake pipe clamps and freight-car brake steps. Represented by G. S. Turner.

Viloco Railway Equipment Company, Chicago.—Sanders, bell ringers, grease lubricators, rail washers, whistle operators and exhaust pipe. Represented by A. G. Hollingshead, J. F. Raps, C. W. Ploen and I. W. Hebner.

Westinghouse Air Brake Company, Chicago.—Brake cylinder protector, reinforced flanged-union hose fittings, packing cups and gaskets, caboose valves, variable release valves and super governors. Represented by C. D. Foltz, A. K. Hohmyer, E. H. Weaver, J. R. Holton, P. E. Yancey, L. M. Carlton, P. H. Donovan and G. C. Farmer.

### The Track Supply Association

Sixty-eight manufacturers of materials and devices used in the construction and maintenance of tracks presented exhibits under the auspices of the Track Supply Association at the Hotel Stevens, Chicago, on September 16-18, in connection with the convention of the Roadmasters' and Maintenance of Way Association, this exhibit being the largest in the history of the organization in the number of firms represented, in the amount of space occupied and in the number of full-size devices and machines shown.

The officers of the Track Supply Association, who were responsible for the exhibit, were: President, L. P. Shanahan, representative, American Steel &

Wire Co., Chicago; vice-president, D. J. Higgins, representative, American Valve & Meter Co., Chicago; secretary-treasurer, L. C. Ryan, representative, Oxweld Railroad Service Company, Chicago; directors, G. M. Hogan, vice-president, Sellers Manufacturing Company, Chicago; W. B. Maurer, assistant to vice-president, American Hoist & Derrick Co., St. Paul, Minn.; L. S. Walker, eastern manager, P. & M. Co., New York; and G. T. Willard, representative, Railroad Supply Company, Chicago.

In the election of officers, Vice-President Higgins was advanced to president; Mr. Willard was elected vice-president; and Mr. Ryan was re-elected secretary-treasurer. Mr. Walker and Mr. Hogan were re-elected as directors for one year and E. Keough, representative, American Fork & Hoe Co., Chicago, was elected director for two years.

#### List of Exhibitors

Achuff Railway Supply Company, St. Louis, Mo.; rail anchors, lock washers, track wrench; W. D. Achuff and G. W. Achuff.

American Chain Company, Inc., Reading Specialties Division, Reading, Pa.; guard rail clamps, one-piece guard rails, rail benders, one-piece rail brace and compromise joints; J. J. O'Connell, M. L. Johnson and W. I. Clock.

American Fork & Hoe Co., Cleveland, Ohio; rail anchors, tapered rail joint shims, safety rail fork, ballast forks, rakes, scuffle hoes and broom rakes; A. F. Fifield, S. L. Henderson, I. T. Reagan, E. Keough, F. C. Stowell, R. C. Violett, J. J. Nolan and J. H. Dooling.

American Hoist & Derrick Co., St. Paul, Minn.; illustrations and photographs of locomotive cranes and ditches; Ward B. Maurer, Helen Hoeller, A. Harvey, A. Craine, J. L. Hickey and D. L. O'Brien.

American Steel & Wire Co., Chicago; fencing, fence posts, signal wire, bonds, wire rope, nails, concrete reinforcement and snow-fence posts; A. W. Froude, C. A. Cochran, L. P. Shanahan, E. E. Aldous, W. Floto, C. S. Knight, C. F. Wiley and R. Francisco.

American Valve & Meter Co., Cincinnati, Ohio; wheel flange and rail lubricators, switch stand and rail joint clamp and switch inter-locator; J. T. McGarry, J. W. McGarry and D. J. Higgins.

Bethlehem Steel Company, Bethlehem, Pa.; steel ties, rail anchors, switch stands, hook-flange guard rail, gage rods, rail and wheel contour machine, track bolts; N. E. Salsich, R. P. Deghuae, C. H. Cecil, J. L. Tygart, G. L. Moore, G. Oyer, G. Riddle, C. V. Phillips, O. W. Johnson, K. F. Beary, R. L. Gillispie and F. M. Hoffman.

Boss Bolt & Nut Co., Chicago; lock nuts; H. E. Burns and George Hanley.

Buda Company, Harvey, Ill.; motor cars, jacks, track liners and rail benders, track drill, section of motor car engine; R. B. Fisher, H. M. Sloan, R. M. Blackburn, J. T. Jung, E. H. Walker, G. A. Secor and E. L. Kastler.

Caterpillar Tractor Company, Peoria, Ill.; Model 15 caterpillar tractor, moving pictures of caterpillar operation on railroads; O. E. Andren and H. L. Wagner.

Chausse Oil Burner Company, Elkhart, Ind.; switch heaters and kerosene torches; McKay White, E. R. Mason and C. P. Dearman.

Chipman Chemical Engineering Company, Inc., Bound Brook, N. J.; chemical weed killers, literature; J. K. Aiman and J. T. Darby.

Creepcheck Company, Inc., New York; rail anchors; R. R. Dinklage, T. D. Crowley, N. A. Howell and V. L. Walker.

Crerar, Adams & Co., Chicago; tools; Russell Wallace, E. C. Poehler, R. M. Bullard, W. L. Riedell, G. D. Bassett, J. M. Temple, J. H. Ruel and O. H. Sneed.

Cullen-Friestedt Company, Chicago; motion picture of rail and locomotive cranes in operation; F. P. Cullen, William C. Bamber, E. V. Cullen, R. W. Payne, G. H. Penglase, F. J. Reagan and C. J. Bronez.

Duff-Norton Manufacturing Company, Pittsburgh, Pa.; track jacks and tie spacers; C. N. Thulin and Dave Evans.

Electric Taper & Equipment Co.; Chicago; two-taper power units and universal and hammer type tapers; C. Jackson, V. G. Cartier, M. S. Westlund, H. W. Cutshall and Roy Cartier.

Enterprise Railway Equipment Company, Chicago; illuminated photographs of box, hopper, gondola and ballast cars, motion pictures of ballast car in operation; Walter L. Gunnison; Richard T. Coyne, Edward F. Schack and George B. Dorey.

Fairbanks, Morse & Co., Chicago; motor cars; B. S. Spaulding, F. M. Condit, J. L. Jones, E. C. Golladay, P. H. Gilleland, H. J. Smith, G. W. Lewis, J. A. Slicer, R. F. Lane and T. M. Eaman.

Fairmont Railway Motors, Inc., Fairmont, Minn.; motor cars, motion pictures of weed burner, mowing machine and discer; Albert C. Force, W. F. Kasper, Robert D. Sinclair, K. K. Cavins, A. R. Fletcher, W. D. Brooks, V. Pagett, C. H. Johnson, C. P. Benning and C. F. Green.

Hayes Track Appliance Company, Richmond, Ind.; models of derrails and bumping posts; Herbert J. Mayer, Ivan M. Druley, Charles L. Starr and Brice E. Hayes.

Hopkins Company, Chicago; tie tamping machine, track-barrow, one-man one-rail maintenance car, portable gasoline-driven grinder; C. F. Hopkins, Thomas J. Lynch and B. F. Gehr.

Hubbard & Co., Pittsburgh, Pa.; shovels, track tools and nut locks; J. S. Wincrantz.

Industrial Brownhoist Corporation, Cleveland, Ohio; photographs of gasoline and steam locomotive cranes and ditches; C. H. White, G. F. Climo, Jr. and G. L. Harman.

Ingersoll-Rand Company, New York; pneumatic tie tamper, rail drill, rock drill, nutting machine, concrete breaker, spike puller, spike driver, wire brush, wood borer, hand grinder, pedestal grinder, screw spike driver and scaling tool; W. H. Armstrong and G. W. Morrow.

O. F. Jordan Company, East Chicago, Ind.; moving pictures of track spreader and track oiler; J. M. Mullholland, J. C. Forbes and H. M. McFarlane.

Kalamazoo Railway Supply Company, Kalamazoo, Mich.; motor cars, section of inspection car engine, supervisor's track gage and level, common track gage; F. E. McAllister, R. E. Keller and L. W. Bates.

Keystone Grinder & Manufacturing Co., Pittsburgh, Pa.; hand and power-driven tool grinders; L. J. Cooney and S. S. Newman.

Koppel Industrial Car & Equipment Co., Koppel, Pa.; photographs of air dump cars; F. C. Dankmyer, H. W. Redman and H. E. Chilcoat.

Lundie Engineering Corporation, New York; tie plates; L. B. Armstrong and Eugene Brandeis.

Maintenance Equipment Company, Chicago; switch point protector, rail and flange lubricator, model of friction car stop, literature on hand and power rail layers, power track ballaster, flange and rail lubricator and fence posts; D. M. Clarke, R. J. Shanahan, T. E. Rodman, H. E. Muhs, E. Overmier and Clifford Hogan.

Mechanical Manufacturing Company, Chicago; bumping post; H. E. Johnson.

Morrison Railway Supply Corporation, Chicago; reclamation of frog and switch material; C. J. Diver, E. W. Smith, R. L. Morrison, M. B. Morrison, Robert Alphonse and George Lamborn.

National Carbide Sales Corporation, New York; flood lights and motor car lantern, locomotive inspector's lantern, car inspector's lantern and carbide; R. C. Holcomb, E. C. Ackerman, F. E. Mull, G. Van Alstyne and C. E. Daly.

National Lock Washer Company, Newark, N. J.; spring washers; W. R. Hillary, R. L. Cairncross, W. E. Bugbee and O. E. Sutherland.

Nordberg Manufacturing Company, Milwaukee, Wis.; adding machine, power rail drill, mechanical spike puller, power jack, and motion pictures of power jack, adding machine, rail drill and spike puller; W. W. Fitzpatrick, Victor F. Larson, H. H. Talboys, E. R. Mason, Chester Clemens, Clyde Jensch and Gus Geer.

Northwestern Motor Company, Eau Claire, Wis.; motor cars, cut out model of motor car engine; A. H. Nelson, F. W. Anderson, Otis B. Duncan, Allan Datesman, O. Phillip and G. H. Goodell.

Orton Crane & Shovel Co., Chicago; literature on cranes and shovels; P. A. Orton, Jr., and A. R. Whitney.

Oxweld Railroad Service Company, Chicago; welding and cutting apparatus, carbide lights, motor car lights; L. C. Ryan, W. F. Kofmehl, J. E. Winslow, F. J. Duffie, D. H. Pittman, M. C. Beymer, W. Leighton, E. S. Richardson, H. W. Schulze, J. G. Tawse, J. J. Saelens, F. C. Hasse, E. Cordeau, A. N. Lucas, W. A. Hogan, W. Jones, J. D. Dunbar and R. J. Nenneman.

P. & M. Co., Chicago; rail anti-creepers and bond-wire protectors; L. E. Borst, D. T. Hallberg, G. E. Johnson, J. E. Mahoney, C. E. Webster, L. S. Walker, J. J. Gallagher, S. M. Clancey, W. A. Maxwell, W. G. Cunningham, P. H. Hamilton and R. W. Payne.

Pettibone Mulliken Company, Chicago; switch stands, mechanical switchman and manganese guard rails; G. J. Slibeck, A. W. Swartz and C. A. Johnson.

Pocket List of Railroad Officials, New York; copies of Pocket List of Railroad Officials; B. J. Wilson.

Positive Rail Anchor Company, Chicago; rail anchors and guard rail plates and braces; A. H. Told and L. C. Ferguson.

Protectoseal Company, Chicago; safety appliances for handling volatile liquids; C. T. Leonard and C. R. Peck.

Q & C Co., New York; guard rail clamp, tie plate and clamp, compromise joint, switch point guard, flangeway guards, derrails, one-piece guard rail and foot guards; J. L. Terry, L. Thomas and L. E. Hassman.

Rail Joint Company, New York; insulated and standard joints, Alexander Chapman, H. C. Hickey, C. B. Griffin, J. N. Meade, Milton Markley, G. L. Brittingham, Thomas Ryan and G. H. Larson.

Railroad Supply Company, Chicago; tie plates; George T. Willard, John Hansel, E. H. Bell, R. E. Bell, H. M. Buck, W. S. Boyce, R. B. Archibald and Arthur C. Dunne.

Railway Engineering and Maintenance, Chicago; copies of Railway Engineering and Maintenance and Railway Age; Elmer T. Howson, F. C. Koch, J. M. Rutherford, W. S. Lacher, M. H. Dick, G. E. Boyd, T. G. Little, H. A. Morrison, W. N. Yaden and H. E. McCandless.

Railway Maintenance Corporation, Pittsburgh, Pa.; motion pictures of ballast-cleaning machines; J. B. McWilliams and J. F. Casey, Jr.

Railway Purchases and Stores, Chicago; copies of Railway Purchases and Stores; Edward Wray, K. F. Sheeran, H. B. Kirkland and J. B. Murphy, Jr.

Railway Track-Work Company, Philadelphia, Pa.; gasoline and electric-driven portable track grinders; A. N. Nardini and Henry Perazzoli.

Ramapo Ajax Corporation, Hillburn, N. Y.; full-size model split switch, switch stands, manganese flange switch guard, switch and guard-rail accessories and rail expander; T. E. Akers, W. Bender, G. M. Cooper, J. E. Davidson, D. Fairback, W. J. Fairback, D. F. Hilton, P. Hoffman, J. V. Houston, John Hutchins, G. A. Carlson, R. W. Payne, T. B. Strong, W. A. Peddle, H. W. Renick and W. Perdue.

Rawls Manufacturing Company, Streator, Ill.; weed-cutting machinery; S. E. Rawls and N. H. Greer.

Reade Manufacturing Company, Jersey City, N. J.; moving picture showing application of chemical weed killer; R. W. Pritchard and D. M. DeWitt.

Reliance Manufacturing Company, Massillon, Ohio; spring washers; Robert Shireman, H. J. McGinn, E. D. Cowlin, E. C. Gross and A. L. Weston.

Republic Steel Corporation, Youngstown, Ohio; guard rail assembly, tie rods, nuts, bolts, spikes, rivets, turnbuckles, tie plates and perforated iron drains; C. H. Aiken, L. L. Soiger and A. D. McAdam.

Sellers Manufacturing Company, Chicago; wrought iron tie plates; R. A. Van Houten, George M. Hogan, R. J. Platt and N. J. Leavitt.

Skelton Shovel Works (American Fork & Hoe Co.), Dunkirk, N. Y.; track shovels, spades and scoops; E. W. McCarty, H. C. Branahl and C. A. Trigg.

Standard Oil Company of Indiana, Chicago; samples of asphalt products and literature; E. P. Keane, E. F. Tegtmeier and G. Combs.

Superior Flake Graphite Company, Chicago; graphite curve grease; Walter R. Pfisterer and W. S. Joyce.

Syntron Company, Pittsburgh, Pa.; Literature and photographs of tie tampers, nut tighteners, rail drills; screw spike drivers, power units, power cars and track grinders; E. D. Jackson and D. G. Black.

Templeton, Kenly & Co., Ltd., Chicago; jacks and tie spacing shoes; W. B. Templeton, George Mayer, C. A. Crane, W. H. Kreer and William Simpson.

Union Switch & Signal Co., Swissvale, Pa.; hand-operated switch mechanism; J. J. Cozzens.

Warren Tool & Forge Co., Warren, Ohio; track tools; Howard Mull and J. A. Martin.

Western Wheeled Scraper Company, Aurora, Ill.; working model of dump car, moving pictures and photographs; Jay Huber and Jess Mossgrove.

Wheeler Track Gauge Company, Gering, Neb.; moving track gauge; Walter Yensen and Arthur Yensen.

Woodings Forge & Tool Co., Verona, Pa.; track tools, rail anchors and reformed angle bars; R. J. McComb, C. L. Woodings, Russell Wallace and E. C. Poehler.

Woolery Machine Company, Minneapolis, Minn.; power bolt tightener, literature on weed burners, snow and ice melters and bolt tighteners; C. H. Smith, Jr. and Garrit Ye.

#### Non-Exhibiting Members

Air Reduction Sales Company, New York.

Bucyrus Erie Company, South Milwaukee, Wis.

Thomas A. Edison, Inc., Bloomfield, N. J.

Electric Railroad Sales Corporation, Chicago.

Indianapolis Switch & Frog Company, Springfield, Ohio.

National Malleable & Steel Castings Company, Cleveland, Ohio.

Prendergast Company, Cleveland, Ohio.

Rodger Ballast Car Company, Chicago.

Verona Tool Works, Pittsburgh, Pa.

William Wharton, Jr. & Co., Chicago.

Wyoming Shovel Works, Wyoming, Pa.



## Supply Trade

**W. F. Summers** has been appointed manager of the Boston branch office recently established by the **H. K. Ferguson Company**, Cleveland, Ohio.

**Ray P. Tarbell**, formerly Cleveland district sales manager of the **Lincoln Electric Company**, has been elected vice-president and secretary of **Robert E. Kinkead, Inc.**, Cleveland, Ohio.

**J. Will Johnson**, vice-president of the Pyle National Company, has been appointed an executive member of the **Railway Business Association** to succeed **Irving T. Hartz**, deceased.

The **Milwaukee Electric Crane & Hoist Corporation**, Milwaukee, Wis., has consolidated its Cleveland, Ohio, office with that of the **Harnischfeger Corporation**, the parent company, at 342 Rockefeller building.

**John A. Roche** has been appointed sales representative in the Chicago district for the frog, switch and crossing reclamation department of the **Electric Railweld Sales Corporation**, with headquarters in the Buckingham building, Chicago.

**C. B. Nolte**, vice-president and general manager of **Robert W. Hunt Company**, Chicago, has been elected president to succeed **John J. Cone**, retired. **J. G. Ogden**, a director and eastern manager, has been elected vice-president, with headquarters at New York.

**W. A. Nugent**, manager of the St. Louis office of the **Independent Pneumatic Tool Company**, Chicago, has been transferred to the latter city as manager of the Chicago territory, and is succeeded by **F. J. Passino**, manager of the Pittsburgh office, who in turn is succeeded by **T. J. Clancy**.

The **Paige & Jones Chemical Company**, New York, has sold to **The Permutit Company**, New York, the Zeolite and lime-soda water softening and blter departments of its business including machinery, inventories, patterns and drawings. The **Paige & Jones Chemical Company** will continue the chemical branch of its business.

**James R. Hamilton**, sales representative of **A. D. Cook, Inc.**, Lawrenceburg, Ind., has been placed in charge of the newly opened office at Grand Rapids, Mich. **H. B. Allen Sickel**, formerly vice-president and chief engineer of the **Layne-Ohio Company**, has been appointed consulting engineer and superintendent of gravel-packed well installations for **A. D. Cook, Inc.**

**H. R. Rowland**, division manager at Philadelphia, Pa. of the **A. M. Byers Company**, Pittsburgh, Pa., has been transferred to Pittsburgh as division manager and **E. L. MacWhorter**, representing the company in western New

York, has been promoted to division manager at Philadelphia. A national sales meeting will be held in Pittsburgh early in October in conjunction with the official opening of the company's new \$12,000,000 plant.

**C. H. Ribble**, for six years in charge of the New York office of the Industrial Controller Company, has joined the New York staff of the **Allen-Bradley Company**; **George Breuer**, formerly connected with the printing press control department of the General Electric Company, has joined the New York office of the Allen-Bradley Company and will confine his activities to the Newark territory and **H. J. Staib**, formerly with the Century Electric Company has joined the sales staff of the Cincinnati office of the Allen-Bradley Company.

**M. J. Czarniecki** has been appointed to the newly created position of manager of tubular sales of the **A. M. Byers Company**, Pittsburgh, Pa. Mr. Czarniecki joined the Pittsburgh sales organization of **A. M. Byers Company** in 1913 and the following year was assigned to the New York office where he remained until his transfer in 1915 to Chicago. After the war in 1918 he returned to Chicago as district manager and the following year was transferred to New York where he remained as district manager until 1925 when he was appointed assistant general manager of sales with headquarters in Pittsburgh, Pa.

The **General Cable Corporation**, Rome, N. Y., on October 1, will combine into a single organization the sales, manufacturing and accounting operations of constituent companies, which have operated as separate divisions. In the future the following companies will transact business only under the name of the General Cable Corporation: **A-A Wire Company**, **American Insulated Wire & Cable Company**, **Atlantic Insulated Wire & Cable Company**, **Detroit Insulated Wire Company**, **Dudlo Manufacturing Company**, **Peerless Insulated Wire & Cable Company**, **Phillips Wire Company**, **Rome Electrical Company**, **Rome Wire Company**, **Safety Cable Company**, **Standard Underground Cable Company**, **Southern States Cable Company**.

**James W. Owens**, formerly welding aide for the Bureau of Construction and Repair of the United States Navy, has resigned as director of welding of the **Newport News Shipbuilding & Dry Dock Company**, to become director of engineering and secretary of the **Welding Engineering & Research Corporation**, New York, of which, through a recent reorganization, **Professor Comfort A. Adams** has become president; **J. H. Deppeler**, vice-president, and **C. A. McCune**, director of research and treasurer. Professor Adams was first president of the American Welding Society and during the World War was chairman of the General Engineering Committee of the Council of International Defense. Mr. Deppeler was president of the American Welding Society from 1920 to 1921.

## Equipment and Supplies

### Locomotives

THE **SANTA MARIA VALLEY** is inquiring for one 2-8-2 type locomotive.

THE **NORFOLK & WESTERN** will build ten Mallet type locomotives at its Roanoke shop.

### Freight Cars

THE **AMTORG TRADING CORPORATION** is now inquiring for 10 air dump cars of 70 tons' capacity. A previous inquiry for 50 air dump cars and about 450 other cars was reported in the *Railway Age* of May 3.

THE **TENNESSEE COPPER COMPANY** has leased 50 tank cars of 50 tons' capacity from the General American Tank Car Corporation. These cars are to be built in the shops of the latter company. Inquiry for this equipment was reported in the *Railway Age* of August 30.

### Passenger Cars

THE **CHICAGO, BURLINGTON & QUINCY** will construct 10 baggage cars, 70 ft. long, in its own shops.

THE **CHICAGO, MILWAUKEE, ST. PAUL & PACIFIC** expects to construct 10 mail and express cars in its shops at Milwaukee, Wis.

THE **ERIE** has ordered two mail and baggage cars from the Bethlehem Steel Company. Inquiry for this equipment was reported in the *Railway Age* of June 21.

### Machinery and Tools

THE **LEHIGH VALLEY** has ordered three gantry cranes from the Milwaukee Electric Crane & Hoist Corporation.

THE **NEW YORK, NEW HAVEN & HARTFORD** has ordered one gantry crane from the Milwaukee Electric Crane & Hoist Corporation.

### Iron and Steel

THE **PERE MARQUETTE** is inquiring for 10,000 tons of rail.

THE **UNION PACIFIC** has ordered 800 tons of structural steel for a bridge over Crow Creek in Wyoming from the American Bridge Company.

THE **LOUISVILLE & NASHVILLE** has ordered 1,287 tons of structural steel for a bridge over the Cumberland river from the American Bridge Company.

## Construction

**BOSTON & MAINE.**—The grade crossing of this road located at Rotterdam Junction, N. Y., on the Rotterdam Junction-Pattersonville county highway, has been designated for elimination by the New York Public Service Commission. The probable cost of the project, which involves a concrete and plate girder bridge carrying the highway over the railroad about 500 ft. east of the present crossing, is \$165,000.

**CANADIAN NATIONAL.**—The Board of Railway Commissioners of Canada has ordered this company to proceed with the construction of a branch line from Luscar, Alta., to serve the Gebo Coal Company. A contract for the construction of the superstructure of a highway subway under the tracks of this company at West street, Brantford, Ont., has been awarded to A. Lothian, Brantford. This structure will carry two main tracks, two passing tracks and a station platform over West street. It will be constructed of precast reinforced concrete slabs which will be placed by company forces. A contract has been let to G. H. Thomas & Son, Ltd., Galt, Ont., for the construction of a passenger station at Owen Sound, Ont., which will be constructed of brick and stucco on a concrete foundation. This company also plans the construction of a new brick passenger station at Parry Sound, Ont. A contract for the construction of a new freight line on the outskirts of Regina, Sask., east of Winnipeg street, has been let to P. Wheelock, Regina. Improvements at Edmonton, Alta., include the construction of a highway subway under four tracks at Ninety-seventh street, a 10-stall addition to the roundhouse and the installation of a 100-ft. turntable. The general contract for the construction of the subway has been awarded to the Jamieson Construction Company, Edmonton, while a contract for the fabrication of the superstructure has been let to the Dominion Bridge Company, Calgary, Alta.

**CANADIAN PACIFIC.**—The general contract for the construction of freight stations and offices at Prince Albert, Sask., Humboldt and North Battleford has been awarded to R. N. Wyatt, Winnipeg, Man.

**CHICAGO GREAT WESTERN.**—The Missouri State Highway commission has authorized this company to construct a concrete viaduct over Highway No. 45 near Beverly, Mo., at a cost of about \$32,000. The cost will be borne by the railroad and governmental agencies.

**KANSAS CITY TERMINAL.**—This company has applied to the Interstate Commerce Commission for authority to construct an extension at Kansas City, Mo., 4,500 feet in length.

**NEW YORK CENTRAL.**—The proposed plan of eliminating the Storm King and

Breakneck crossings of this company's tracks south of Storm King station, N. Y., by carrying the highway through an 825-ft. tunnel east of the tracks, as outlined in the *Railway Age* of July 19, has received the approval of the Public Service Commission of New York. The commission has also approved an estimate of cost totaling \$50,000, one-fourth of which will be borne by this company, for the construction of tower H in connection with the elimination of grade crossings at Austin, Amherst, Tonawanda and other streets in Buffalo, N. Y., a project which the New York Central is carrying out in co-operation with the Erie and the Canadian National, as previously reported in the *Railway Age*.

The commission has also designated for elimination a grade crossing on the Alden-Crittenden county highway just west of Crittenden station, Alden, N. Y., by carrying the highway above the grade of the railroad at a cost of about \$130,150, and another crossing located at Montrose station, Cortland, N. Y., by carrying the highway over the tracks 108 ft. north of the present crossing.

**NEW YORK, NEW HAVEN & HARTFORD.**—The Public Service Commission of New York has ordered changes costing \$79,000 in the highway bridge carrying the Cocheton turnpike over this company's line in Montgomery, N. Y., and has also approved an estimate of cost amounting to \$25,600 for the widening of the highway bridge carrying the Post county highway over the New Haven tracks in Lloyd, N. Y.

**OZARK & PHILPOTT VALLEY.**—The Interstate Commerce Commission has granted this company's application for the construction of a line running from Ozark, Ark., northerly and easterly a distance of about seven miles, all in Franklin county.

**PACIFIC GREAT EASTERN.**—A contract for the construction of the substructure of a bridge over the Fraser river near Lillooet, B. C., has been awarded to Stewart & Barber, Vancouver, B. C., at a cost of about \$60,000. The contract specifies the completion of this work before May 31, 1931.

**PENNSYLVANIA.**—The New York Public Service Commission has ordered for elimination a grade crossing on the Clymer-Panama highway two miles south of Panama station, Clymer, N. Y. The elimination is to be carried out at a point 142 ft. southwest of the present crossing by running the highway under the grade of the two railroad tracks, which will be supported on a 75-ft. girder span, with a clearance of 14 ft., costing about \$138,000.

**TEXARKANA & FORT SMITH.**—Work on the reconstruction of the bridge over the Little river at Morris Ferry, Ark., will be undertaken with company forces. As reconstructed the bridge will have a total length of about 1,350 ft. with three steel girder spans, each 84 ft. long.

## Financial

**BALTIMORE & OHIO.—Abandonment.**—This company has applied to the Interstate Commerce Commission for authority to abandon a branch line from Flatwoods to Sutton, W. Va., 5.63 miles.

**CHESAPEAKE & OHIO.—Acquisition.**—The Interstate Commerce Commission has authorized this company to acquire and operate the railroads and properties of the Wellston & Jackson Belt and the Pomeroy Belt, the former a 17.3 mile line between Dundas, Ohio, and Jackson and the latter a 4-mile line between Pomeroy and Forest Run.

**CHICAGO & ALTON.—Protective Committee.**—A committee has been formed under the chairmanship of H. M. Blair, president of the Associated Bond & Share Corp., New York, to protect the interests of the holders of the 4 per cent non-cumulative preferred stock of this company. The notice of the formation of the committee calls attention to the acquisition of or offer for the 3½ and 6 per cent bonds of the company by the Baltimore & Ohio "with the avowed purpose of reorganizing the road in a foreclosure proceeding." No provision having been made as yet for the preferred stockholders, the committee asks them to deposit their stock with its depository, the Bank of America National Association, 44 Wall Street, New York, so that it may take action in their behalf.

**CHICAGO & NORTH WESTERN.—Bonds.**—This company has applied to the Interstate Commerce Commission for authority to issue and sell \$12,000,000 of 4½ per cent first and refunding mortgage bonds, Series C, now held in the treasury, to reimburse the treasury for capital expenditures made in 1926 and 1927. It is proposed to sell the bonds to Kuhn, Loeb & Co., at 97½ and interest.

**CINCINNATI UNION TERMINAL.—Bonds.**—J. P. Morgan & Co., the First National Bank (N. Y.), Kuhn, Loeb & Co., and the National City Co. are offering \$12,000,000 of first mortgage 4½ per cent series A bonds of this company to mature in 2020. The issue, subject to the approval of the Interstate Commerce Commission, is guaranteed by the B. & O., the C. & O., the C. N. O. & T. P., the C. C. C. & St. L., the L. & N., the N. & W., and the Penn., and is priced at 102¼ to yield 4.39 per cent.

**LONGVIEW, PORTLAND & NORTHERN.—Acquisition.**—The Northern Pacific, the Oregon-Washington and the Great Northern have applied to the Interstate Commerce Commission for authority to acquire control of a part of the line of the Longview, Portland & Northern from Longview Junction to Vader Junction, Ore., 24.5 miles, each contributing one-third of the purchase price of \$4,135,736.

**NEW ORLEANS, TEXAS & MEXICO.—Acquisition.**—This company has applied



to the Interstate Commerce Commission for authority to acquire control of the Rio Grande & Eagle Pass by purchasing its entire stock for \$337,500.

**NEW YORK, CHICAGO & ST. LOUIS.—Bonds.**—The Interstate Commerce Commission has authorized this company to issue \$36,000,000 of refunding mortgage 4½ per cent series C bonds to retire maturing and outstanding obligations. The issue will mature in 1978 and is redeemable in advance of that date at 102. The issue has been authorized for sale to the Guaranty Company of New York, with which firm Harris, Forbes & Co., and Dillon, Read & Co. are associated in this transaction, at 95¼, making the average annual cost to the railroad 4.752 per cent.

**PENNSYLVANIA.—Trackage Rights.**—This company has applied to the Interstate Commerce Commission for authority to operate under trackage rights over the line of the New York, Chicago & St. Louis between Farmdale and Wesley Junction, Ill., 4.61 miles, to reach the facilities of the Peoria & Pekin Union.

**PENNSYLVANIA.—Bonds.**—The Interstate Commerce Commission has authorized the Cleveland & Pittsburgh to issue \$711,000 of general and refunding mortgage 4½ per cent bonds series A to be delivered to the Pennsylvania in settlement of a like amount of indebtedness, the parent company assuming liability as lessee and guarantor of the bonds.

**PENNSYLVANIA.—Bonds.**—This company has applied to the Interstate Commerce Commission for authority to assume obligation and liability as lessor and guarantor in respect of \$23,735,000 of general mortgage 4½ per cent bonds of the Pittsburgh, Cincinnati, Chicago & St. Louis and \$7,182,000 of general and refunding mortgage 4½ per cent bonds of the Cleveland & Pittsburgh and to sell the bonds to Kuhn, Loeb & Co., at 98¼ and interest.

**Clayton Law Complaint.**—The Interstate Commerce Commission has assigned its complaint against the Pennsylvania Railroad and the Pennsylvania Company for alleged violation of the Clayton act in the acquisition of stock of the Wabash and Lehigh Valley for oral argument at Washington on October 10.

**PITTSBURGH & SHAWMUT.—Final Valuation.**—The Interstate Commerce Commission has issued a final valuation report as of 1919 finding the final value for rate-making purposes of the property owned and used for common-carrier purposes to be \$10,815,000.

**ST. LOUIS-SAN FRANCISCO.—Bonds.**—This company has applied to the Interstate Commerce Commission for authority to sell \$10,000,000 of consolidated mortgage 4½ per cent bonds at 90¼ and interest to Speyer & Co., J. & W. Seligman & Co., and the Guaranty Company of New York. The bonds are now pledged as collateral for short term notes and it is proposed to use the proceeds to pay bank loans and for other purposes.

**SOUTHERN PACIFIC.—Proposed Acquisition of St. L. S. W.**—The Interstate Com-

merce Commission has authorized the Missouri-Kansas-Texas and the Kansas City Southern to intervene in the proceedings on this company's application for authority to acquire control of the St. Louis Southwestern.

### Average Prices of Stocks and of Bonds

	Sept. 23	Last week	Last year
Average price of 20 representative railway stocks.	111.72	114.37	155.39
Average price of 20 representative railway bonds.	95.78	95.49	89.55

### Dividends Declared

**Belt R. R. & Stock Yards.**—Common, \$1.00, quarterly; Preferred, 75c, quarterly, both payable October 1 to holders of record September 20.

**Cleveland, Cincinnati, Chicago & St. Louis.**—Preferred, 1¼ per cent, quarterly, payable October 31 to holders of record October 21.

**Joliet & Chicago.**—1¼ per cent, quarterly, payable October 6 to holders of record September 26.

**Kansas City Southern.**—Common, \$1.25, quarterly, payable November 1 to holders of record September 30; Preferred, \$1.00, quarterly, payable October 15 to holders of record September 30.

**Midland Valley.**—Common, \$1.25, semi-annual, payable October 15 to holders of record September 30.

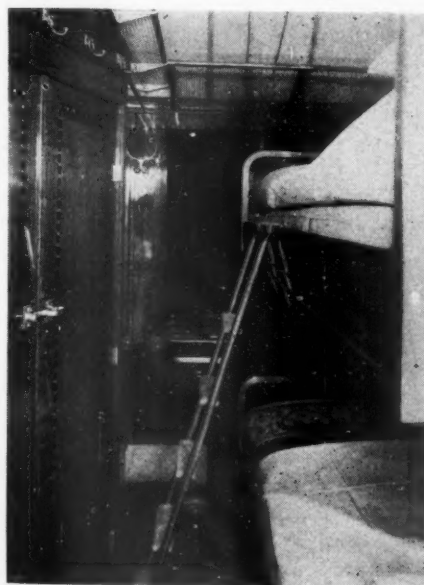
**Minneapolis, St. Paul & Sault Ste. Marie,** leased lines.—\$2.00, payable October 1 to holders of record September 20.

**Norfolk & Western.**—Adjustment preferred, \$1.00, quarterly, payable November 19 to holders of record October 31.

**Northern Pacific.**—\$1.25, quarterly, payable November 1 to holders of record September 30.

THE GREAT WESTERN of England has ordered from the General Railway Signal Company of London, 380 color-light signals, of which 335 will be type SA, single lens. The order includes also 400 type L Vane relays. This material will be made at Manchester, England.

\* \* \*



**New Type of Second Class Sleeping Compartment, Swedish State Railways**

Sleeping cars divided into compartments of the type shown here are to go into use on the Swedish State Railways in the near future. Since they will be operated between Stockholm and Malmö, Stockholm and Gothenburg, and on other one-night runs where day occupancy of the cars is not required, it has been possible to gain a maximum of comfort by designing compartments exclusively for night travel. The cars also have first class compartments similar to the one shown above, but with only one berth.

## Railway Officers

### Executive

**Paul H. Van Hoven**, wage schedule supervisor of the Duluth, Missabe & Northern, has been promoted to assistant to the president, with headquarters as before at Duluth, Minn.

### Financial, Legal and Accounting

**J. A. Soule** has been appointed general solicitor of the Toronto, Hamilton & Buffalo, succeeding **E. D. Cahill**, deceased.

**Allan P. Mackinnon**, general solicitor of the Boston & Maine, has been appointed general counsel. The positions of general solicitor and solicitor have been abolished in a general re-organization of the B. & M. legal department. **W. A. Cole**, general solicitor, becomes general attorney and **George E. Kimball**, **John B. Sawyer** and **Richard W. Hall**, assistant solicitors, become attorneys. **Paul O. Klinger**, tax accountant, has been appointed tax commissioner.

### Operating

**H. L. Margetts**, superintendent of the West division of the Michigan Central, with headquarters at Chicago, has been promoted to general superintendent, with headquarters at Detroit, Mich. **E. E. Wright**, superintendent of the Canada division, with headquarters at St. Thomas, Ont., has been transferred to the West division, succeeding Mr. Margetts. **J. E. Schwender**, chief clerk to the general manager at Detroit, has been promoted to superintendent of the Canada division, succeeding Mr. Wright.

### Traffic

**J. H. Hughes** has been appointed general agent of the Wichita North-Western at Larned, Kan.

**H. J. Spangenberg**, commercial agent of the Erie at Detroit, Mich., has been appointed general agent with headquarters at Toledo, Ohio, succeeding **C. Morrison**, deceased.

**Henry B. Cole**, general agent for the Chicago, Indianapolis & Louisville at Tulsa, Okla., has resigned effective October 1 to accept the position of traffic manager of the Taylor Refining Company at Taylor, Tex.

### Purchases and Stores

The headquarters of **R. M. Nelson**, purchasing agent of the Chesapeake & Ohio, and **A. Singleton**, assistant purchasing agent, have been removed from Richmond, Va., to Cleveland, Ohio.

## Engineering, Maintenance of Way and Signaling

**H. M. Warren**, electrical engineer of the Delaware, Lackawanna & Western, has been appointed consulting electrical engineer and **J. S. Thorpe**, electric traction engineer, has been appointed electrical engineer, with headquarters as before at Hoboken, N. J.

## Byers and Gray, Western Maryland Heads, Killed

Maxwell C. Byers, president and chairman of the board of directors of the Western Maryland, was killed, and Dudley G. Gray, vice-president in charge of traffic of the same company, was mortally wounded in a shooting affray



Maxwell Cunningham Byers

which occurred about noon, Tuesday, September 23, in the general offices of the railroad in the Standard Oil Building, Baltimore, Md. Mr. Gray was removed to the nearby Mercy Hospital, where he died a few hours later.

Maxwell Cunningham Byers, president and chairman of the board, was born on

## Obituary

**E. D. Cahill**, general solicitor of the Toronto, Hamilton & Buffalo, died at his home in Hamilton, Ont., on September 11, after two months' illness. Mr. Cahill had been connected with the T., H. & B. since its organization, serving continuously in the legal department, and was appointed general solicitor in 1906.

February 2, 1878, at Pittsburgh, Pa., and was educated at the University of Pittsburgh. He entered railroad service with the Pennsylvania in March, 1897, as assistant in the engineering corps and served in this capacity on various divisions until November, 1900, when he was promoted to assistant engineer of the Marietta division. In December, 1902, he became assistant engineer, maintenance of way, of the Baltimore & Ohio and in August, 1903, was promoted to division engineer of the Baltimore division. In August, 1904, he entered the service of the St. Louis & San Francisco (now the St. Louis-San Francisco), as assistant engineer, maintenance of way. He was promoted to assistant to general manager in June, 1905, and in January, 1906, he became engineer maintenance of way. From January, 1909, to January, 1910, he was chief engineer and on the latter date he was advanced to chief engineer, operation. In March, 1913, he became assistant to the president of the Great Northern, continuing with this road until March, 1914, when he entered the service of the Western Maryland in a similar capacity. From July, 1918, to March, 1920, he was federal general manager of the Western Maryland, the Cumberland Valley (now part of the Pennsylvania), and the Cumberland & Pennsylvania. Mr. Byers was appointed president of the Western Maryland in March, 1920, and since 1926 he had also served as chairman of the board.

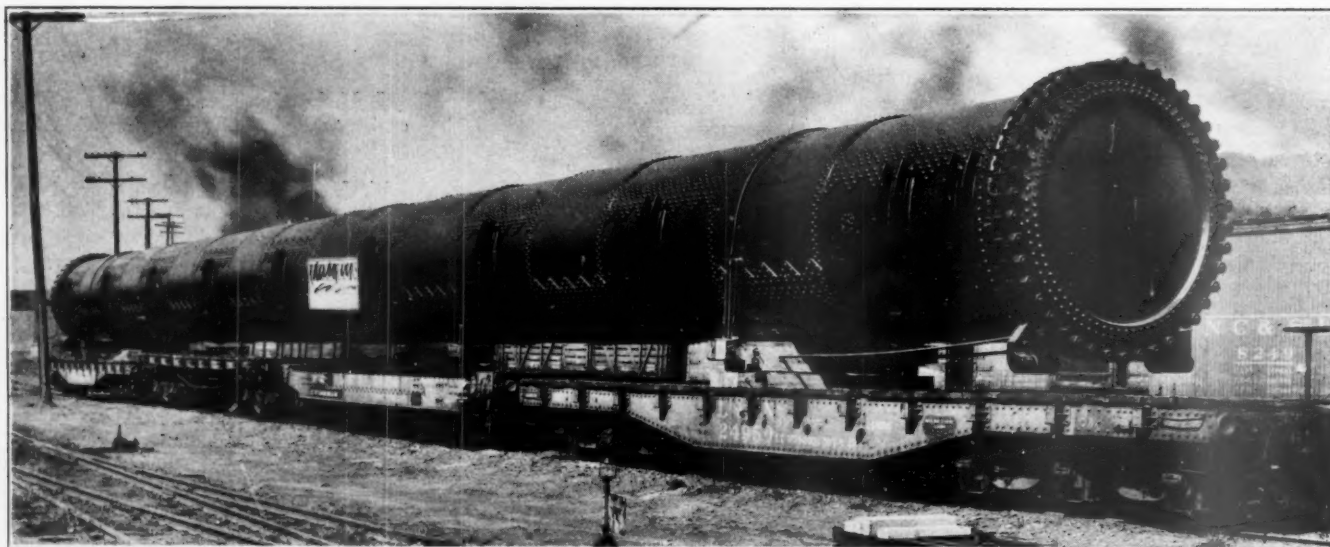
\* \* \* \*

Dudley Guy Gray, vice-president, was born on May 15, 1869, at Columbus, Ohio, and was graduated from Ohio State University in 1883. He entered railroad service with the Baltimore & Ohio on October 1, 1887, as a messenger, subsequently serving in various clerical capacities, including that of chief clerk in the division freight office at Columbus, until June, 1897, when he was appointed chief clerk in the general freight office at Pittsburgh, Pa. In July, 1902, he became division freight agent and served in this capacity until April, 1910. At that time he was promoted to general freight agent at Pittsburgh and held this position until January, 1913, when he entered the service of the Western Maryland as general western freight agent, with headquarters at Pittsburgh. From November, 1913, to



Dudley Guy Gray

September, 1916, he was general freight agent at Baltimore, Md., and in September, 1916, he was promoted to freight traffic manager. In November, 1919, he became general traffic manager and in March, 1920, was promoted to vice-president, traffic, the position he held at the time of his death.



Photo, courtesy N. C. & St. L. News Item

### A Shipment That Did Not Go By Motor Truck

The retort shown in the illustration, which was consigned to the American Creosote Works, Jackson, Tenn., is believed to be the largest structure of the kind that ever was transported a long distance on land in one piece. It was recently carried from Birmingham, Ala., via Nashville, to Jackson, Tenn., over the Louisville & Nashville and the Nashville, Chattanooga & St. Louis. It is 153 ft. long, 8 ft. in diameter and weighs 229,400 lb. The first and the fourth cars, on which the retort rests, have 12 wheels each.



# Railway Age

Motor Transport Section  
Devoted to the  
Coordination of Railway and Highway Service

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## Contents

### Truck Competition Is Taking the Railways' Carload Traffic .. Page 648

L. B. Young, vice-president and manager of the Pacific Motor Transport Company, discusses important present aspects of highway competition for freight traffic and mentions several typical motor truck services which are competing with the railways for carload as well as l.c.l. business.

### Maintaining the B. & O. Train-Connection Coaches ..... 652

A description of the maintenance system whereby the 29 vehicles operating between New York and Brooklyn and train side at Jersey City, are serviced by the Fifth Avenue Coach Company, the contract operator.

### Putting Equipment Where It Is Needed ..... 662

Glenn Johnson, chief dispatcher, Greyhound Management Company, tells of economies effected by anticipating requirements in connection with the assignment of 638 Greyhound Lines motor coaches.

#### EDITORIALS

Losing Carload Freight .....	645
Contract Truck Operators Subject to Regulation .....	646
Safety at Grade Crossings .....	646
"Paramount Rights" .....	647

#### GENERAL ARTICLES

Truck Competition Is Taking the Railways' Carload Traffic, by L. B. Young .....	648
Maintaining the B. & O. Train-Connection Coaches .....	652
Running Reconditioned Engines to Test Horsepower Output .....	656
Saving Money by Better Truck Operation, by H. R. Cobleigh .....	657
Preparations for Winter Weather .....	659
Motor Coach Accident Prevention on S. P. & S., by W. R. Sherman .....	661
Putting Equipment Where It Is Needed, by Glenn Johnson .....	662

#### GENERAL ARTICLES—Continued

Using the Oxy-Acetylene Torch in the Repair Shop, by F. J. Fitz Gerald .....	665
--	-----

#### NEW EQUIPMENT

Studebaker Brings Out Low-Priced 1½ and 2 Ton Trucks .....	668
FWD Announces a New 7½ Ton Model .....	669
Chevrolet Announces An Improved 1½ Ton Truck .....	670
McKenzie Tire Mounting and Demounting Machine .....	670
Power Take-Off Transmission .....	670
Bosch Direction Indicator .....	671
Engine Temperature Indicator .....	671
Electric Body Polisher .....	671

EVERY-DAY PROBLEMS OF MOTOR COACH AND TRUCK OPERATION .....	672
MOTOR TRANSPORT NEWS .....	675

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Associate Editor

The Railway Age is a member of the Associated Business Papers (A. B. P.) and of the Audit Bureau of Circulations (A. B. C.)

# As A BUS OPERATOR

**—YOU SHOULD KNOW THAT ELECTRIC DRIVE WILL  
INCREASE THE LIFE OF  
YOUR BUSES 50 PER CENT**

**O**PERATORS who have used both mechanical and gas-electric buses have found that the gas-electrics last 50 to 100 per cent longer than mechanical buses of the same type and in the same service. As a result, they have been enabled to decrease their depreciation charges a corresponding amount.

The longer vehicle life of the gas-electrics is due to lower average engine speed, absence of gear shifting with accompanying jerking and straining, less vibration, and reduced probability of accident.



Let the General Electric transportation engineers analyze your service and make recommendations for the best type of equipment.

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390-49



## Losing Carload Freight

**W**HAT kind of traffic are the railways losing to competitive motor truck lines—short-haul, l. c. l. freight or long-haul, carload freight? This point is raised by L. B. Young, vice-president and manager of the Pacific Motor Transport Company, a Southern Pacific subsidiary, who, in an article in this issue of the *Motor Transport Section*, points out that the competition for short-haul, l. c. l. freight is no more of a problem to the railways, if as much of one, than the competition for carload freight moving over substantial distances.

### *Persistent Extension of Trucking Lines*

The average motor truck is a small-capacity type of carrier in comparison with a railroad freight train or even a freight car. During recent years, there has been much talk of the "economic sphere" of the motor truck, and many authorities have soberly ascribed to it a radius of between 50 and 100 miles. Unfortunately, many motor truck operators are poor economists and have persisted in extending their lines over routes several hundred miles in length. Furthermore, improvements in the design and construction of motor trucks have culminated in a vehicle capable of high speed and, in combination with trailers, capable of carrying 20 or more tons of freight—a good freight-car load. The result is that the motor truck has developed into a competitor for freight traffic in carload lots moving over long distances, as well as a competitor for short-haul, l. c. l. traffic.

### *Some Long Truck Routes*

Mr. Young, in his article, mentions several typical motor truck services which are competing with the railways for freight traffic, carload as well as less carload. One company advertises an overnight motor truck service between Los Angeles, Cal., and San Francisco, a distance of 480 miles, this run being commonly made in 15 hours or less. Another company is operating motor trucks on daily schedules between Los Ange-

les and Phoenix, Ariz., 470 miles, and between Los Angeles and Tucson, a distance of 502 miles. Trucking companies operating over routes of lengths such as these are adopting an interesting expedient to make it possible to keep their trucks and freight moving with a minimum of delay. The trucks are manned by a regular driver and a relief driver, so that while one is at the wheel, the other rests on a berth built into the driver's cab behind the driver's seat.

### *What Moves By Truck?*

"That the trucks primarily are hauling car-load and not l. c. l. freight is readily apparent from no further analysis than casual observation of the loads that are constantly to be seen moving over the highways," says Mr. Young. "The amount of so-called 'package' freight is noticeably insignificant in comparison with the multitude of truck and trailer loads of bulk commodities that essentially are carload in their character."

A check of the truck traffic moving over the principal highways out of Los Angeles, showed that the following commodities are being truck-hauled in substantial volume: Cement, lumber, structural steel, nails, spikes, and bolts in kegs, iron pipe, hay, cotton, acetylene gas cylinders, fresh fruits and vegetables, grain, canned goods, gasoline in tank trucks, lubricating oil in drums, live stock, fresh meat, and newsprint paper.

### *Bankrupts Readily Replaced*

Mr. Young says further, "Largely the trucks are taking this traffic because they are charging less than the rail rates. Whether or not this is economically sound is beside the question. The fact remains that the trucks have cut and still are cutting heavily into the car-load business of the railroads, just as in an earlier day they cut into the l. c. l. traffic. If, in his over-anxiety to attract business at whatever cost, an independent operator cuts his rate to a point so low that he goes broke, there appears always to be some one else to take his place."

How shall the railways meet this competition? This

is a problem which railways in many parts of the country are facing. Two courses appear to be open, if we eliminate the recourse of rate reduction which has too often been entirely unsuccessful in meeting truck competition, the first course would be an attempt to bring about some stabilization of the motor truck operating companies through regulation, which would eliminate the shoe-string operator who is here today, bankrupt tonight and replaced by another of the same sort tomorrow. The other course—suggested by Mr. Young—is that the railways obtain authority to become sufficiently flexible, through the co-ordination of motor transport and railway facilities, to meet truck competition as they find it.

## Contract Truck Operators Subject to Regulation

THE Georgia Supreme court, as reported in the *Motor Transport Section* of August 23, has upheld the power of the Public Service Commission of Georgia to regulate motor truck operators carrying on their business through contracts with individual shippers. The truck operator involved in the case, although incorporated as a common carrier, confined his business to the transportation of shipments for only five customers.

Upon learning that the Public Service Commission of Georgia proposed, under the Georgia Motor Carrier Act of 1929, to assume jurisdiction over his business, the truck operator petitioned for an injunction to restrain the commission. This injunction was granted, but the commission insisted that, even if the truck operator were a private carrier only, he would still be subject to regulation by the commission. Now the Supreme court of the state has upheld this contention of the commission.

Excerpts from the Supreme court's decision are interesting: "We think that the controlling point is not one of differentiation, but public interest. If this transfer company can make contracts as a private carrier with five customers, it can just as lawfully do so with 500 others, and in each of the additional instances it would be as much a private carrier as before. The result would be that the state, which owns the highways, would be compelled to keep up the track used by this private carrier, maintain and repair it, and be helpless when the carrier would tauntingly say, 'I used your road in my business and let the citizens of the state keep up my means of transportation.'

"Numerous courts have decided that, where the use of the highways is by one who conducts a business which affects the public interest, such business is subject to regulation by the state. The state has a proprietary right in and to its highways and, therefore, has the

power to prohibit or regulate and control the use of its highways for purposes of private gain."

The court did not hold that this truck operator was a common carrier, but it did rule that the operator was as much subject to the regulatory provisions of the Georgia Motor Carrier Act of 1929 as if he had, in practice, been a common carrier.

In a concurring opinion, Justice Gilbert said, "The effect of the growing business of operating motor vehicles for hire on the public highways must be apparent to every man of ordinary sense. Courts cannot be blind to those things that are apparent to every citizen. The construction and maintenance of the public highways is of vast importance to the happiness and prosperity of all. Upon our public highways are expended immense sums of money, time and labor, all of which must be supplied by the general public. . . . The size and weight of such motor vehicles constitute an extra burden on the wear and tear of highways and add to the dangers. It is unthinkable that the sovereign state cannot lay its hand on the traffic for the purpose of regulation, control, or even prohibition where regulations are not obeyed."

It is inevitable that sooner or later there will be full and adequate regulation of all motor vehicles using the public highways as a place of business. Such regulation need not be expected to bring an end to motor coach and motor truck transportation, but it may and should put a stop to the exploitation of the public highways for private profit without regard to the interests and actual needs of the public.

## Safety at Grade Crossings

RAILROAD grade crossing accidents involving motor coaches have not been numerous, but there have been enough of them, and of such tragic nature, as to make their permanent prevention a matter of vital interest to all motor coach operating companies.

That motor coaches can be operated day after day over hundreds of grade crossings without accident is indicated by the records of some of the largest operating companies in the country. The Pacific Greyhound Lines, for example, have never had a grade crossing accident in their history. Such accidents have been prevented, not by good luck, but by rigid enforcement of stringent operating regulations.

In the states where the Pacific Greyhound Lines operate, motor coaches must stop at all railway crossings, except those protected by city or county officers on duty to warn motor vehicle drivers of the approach of trains.

But the Pacific Greyhound Lines go farther than this. The management insists that all drivers, whether carrying passengers or not, must, under all conditions, stop



before crossing a railroad track and both look and listen for approaching trains. This requirement is enforced regardless of the presence of signal gates, wigwags, or watchmen at the crossing. Furthermore, if the motor coach driver cannot see that the track is clear for a distance of 1,000 ft. in both directions, he is forbidden to continue until by personal inspection he has made certain that there is no train approaching.

Carelessness on the part of the driver is the cause of most, if not all, grade crossing accidents. Strict regulations, enforced to the letter, can prevent such carelessness. Railway motor coach lines, in particular, should be most assiduous in their efforts to prevent even a single grade crossing accident involving one of their motor coaches, for obvious reasons.

## "Paramount Rights"

SINCE the advent of the motor coach and the motor truck, much has been said about the "paramount right" of railways to provide all of the transportation service warranted by the needs of the territories through which their trains operate. Many railways have applied positive action to the situation, and have defended their "paramount rights" in petitions of their own for certificates to operate motor vehicles wherever patrons desired such service or where a threatened invasion by independent highway operators jeopardized railway revenues. As a result, these railways have not only realized substantial earnings or effected marked economies with motor coaches and trucks, but have also established their "paramount right" to provide the highway transportation services in the territories involved.

Other roads have remained content to defend their "paramount rights" in what might be called a negative manner; they have asserted them in opposing applications for highway certificates, filed by independent operators, but have accompanied this opposition with no offer to provide such highway service as seemed warranted by the public demand.

This latter course seems to have been futile for it has not stayed the spread of independently-controlled motor coach and truck lines. More serious, however, is the suggestion that some of these independent lines have themselves established a "paramount right" to provide highway services in territories which were served by railways long before the inception of motor transportation.

That this latter suggestion bids fair in some cases to become embodied in regulatory principles is indicated in a recent order of the Board of Public Utility Commissioners of New Jersey. This commission recently denied the petitions of several applicants for the approval of municipal consents to operate motor coaches on the Jersey City-Camden, N. J., route. (See *Motor*

*Transport Section* of August 23, page 420.) Among these unsuccessful applicants was the Pennsylvania General Transit Company, highway subsidiary of the Pennsylvania; other principals were the Public Service Co-ordinated Transport and the Nevin Bus Line, Inc. The latter was already operating motor coaches over the route as a section of its New York-Philadelphia line. Its intrastate business within New Jersey had been subjected to certain restrictions, and a removal of these was sought. The other two applicants each proposed the inauguration of entirely new motor coach services.

In discussing these three petitions, the board pointed out that "the Pennsylvania General Transit Company contends that it had a paramount right over all the other petitioners . . . because its affiliated company . . . had been rendering railroad service over this route for over fifty years past. The Public Service Co-ordinated Transport contended that it had a paramount right . . . because one of its predecessor companies had served over the entire route a street transportation system for many years past . . . The Nevin Bus Line, Inc., claimed a paramount right . . . because it had first inaugurated a motor coach service along the route and was actually serving under restrictions over the entire route . . ."

As the board found that public convenience and necessity did not warrant any of the additional motor coach service proposed, it did not pass upon the question of priority. It did, however, comment on the contentions of the three principal applicants, and held it to be "a recognized principle of regulation that where a utility already in the territory is willing to increase its facilities to supply the additional demand, it should have the prior right to do so." And following the enunciation of this principle comes the suggestion that "under such circumstances, it might very well be that the Nevin Bus Line, Inc., which is now rendering the identical class of service, but in a limited manner due to the restrictions of this board, might have a paramount right to increase the service which it has supplied for several years past . . ."

Here then is a hint to railways that have thought of motor transport operations as a future possibility, but have heretofore defended their "paramount rights" only in the negative manner which was mentioned at the outset.

It indicates an attitude which may spread among regulatory commissions. Such a disposition to look upon independent highway lines of a few years' standing as enfranchised with paramount rights in a territory may well work to the disadvantage of railways later desiring to inaugurate highway service in territories where these independents are entrenched. As has been suggested from time to time in these columns, delay will only aggravate the problem, and here is a concrete example of how undue delay may eventually eliminate railways as contenders for those highway routes which they desire.



A Load of Pipe on a Truck and Trailer

# Truck Competition

## *Is Taking the Railways'*

## Carload Traffic

By L. B. Young

Vice-president and manager, Pacific Motor Transport Company

**R**EVIEW of a recent issue of a railway journal devoted to the co-ordination of railway and highway service disclosed, in the one issue, thirty-two references to loss of short haul l.c.l. freight by the railroads to the motor trucks but not a single

reference to the loss of long haul or carload traffic. If this lack of any discussion of losses in long haul or carload tonnage truly indicates that concern is being felt only with respect to the loss of short haul, l.c.l. freight, it appears not untimely to wonder whether the real problem is not being overlooked entirely. For, as a matter of fact, the great bulk of freight that is now moving on the highways by truck is not l.c.l. freight; distinctly, it is carload in its character, and rapidly it is becoming long-haul.

Limiting the problem to l.c.l. traffic and short hauls completely ignores the almost revolutionary changes that have taken place in highway trucking in the last few years. At one time the railroads, being the only practical means of bulk transportation, carried all of the freight. With the advent of even the earliest types of slow-speed, solid-tired motor trucks of limited capacity, operating on only reasonably well paved highways, some inroads were made into the l.c.l. short haul traffic of the railways. As improved trucks and better roads were developed, highway trucking rapidly increased until the railroads, slow though they may have



A Truck Which Provides Overnight Service Between San Francisco and Los Angeles—480 Miles in 15 Hours



been to recognize them as such, eventually came to look upon the trucks as serious competitors, at least for the so-called merchandise class of tonnage. More recently, with great networks of concrete highways widespread throughout the country, more efficient motors, pneumatic tires and greatly increased truck capacities, the entire picture has changed to one of such enormous proportions as to constitute a really serious menace to the revenues of the railroads.

#### Truck and Trailer Carry Twenty Tons

Twenty tons of freight—the equivalent of a carload—to the truck and trailer, and forty miles an hour on the highway are no longer uncommon; and this is the new problem that has to be met.

The term "long haul" is a relative one; and in using it here to describe truck hauls, reference is made, of course, not to transcontinental operations, but to the greatly extended truck hauls that now appear to be practicable, as compared with the relatively limited distances that could be covered a short while ago. During the earlier periods of truck operation, their competition was found largely within a range of about one hundred miles—that is, within the territory that could be reached over-night with the slow-speed motors and solid tires that were available in that day. As better roads and more efficient automotive equipment were developed, truck carriers gradually extended their operations until the distance was doubled, and their competition began to be felt upward to two hundred miles from distributing centers.

Within the last two years, improvements of even greater moment have been made in both trucks and truck tires. Practically all modern highway trucks are now equipped with high-speed, six-cylinder motors and balloon tires, which give them passenger car speed with far greater loads than they ever have been capable of carrying before; and the result is that their competition is now found to prevail quite generally on hauls up to 500 miles. Taking some typical examples from California, an accompanying illustration shows one of the trucks of the California Motor Express which advertises an overnight service between Los Angeles and San Francisco, a distance of 480 miles; and it is commonly reported that this run is being made in 15 hr. or less. Of equal interest is the operation of the Los Angeles &



A Cowl Sleeper Cab—The Relief Driver Sleeps Until It Is His Turn to Take the Wheel

Phoenix Express, depicted in another illustration. This line operates between Los Angeles and Phoenix, Ariz., a distance of 470 miles; and between Los Angeles and Tucson, a distance of 502 miles. Both of these lines are presumed to be operating daily service on regular schedules. The installation of a bed or berth behind the driver's seat in a motor truck cab is now common. It is used by the alternate driver on long runs.

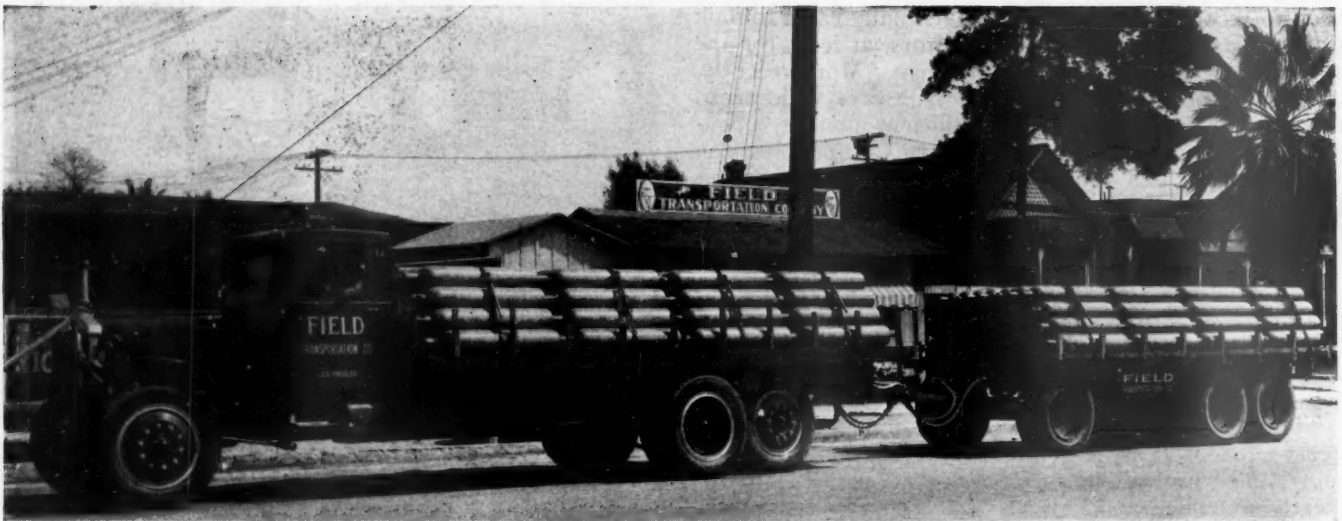
In classifying such carriers as these as "long-haul" operations, the term, of course, may not be used in exactly the same sense in which it generally is used in the railroad business. But these 500 mile runs, compared with the hundred mile limitation that prevailed a few years ago, offer a rather convincing suggestion that attention should be directed by the railroads to the protection of their long-haul traffic.

#### What Trucks Are Hauling

That the trucks primarily are hauling carload and not l.c.l. freight is readily apparent from no further analysis than casual observation of the loads that are constantly to be seen moving over the highways. The amount of so-called "package" freight is noticeably insignificant in comparison with the multitude of truck and trailer loads of bulk commodities that essentially are carload in their character.



Hay, Another Commodity Which Trucks Are Hauling



### Acetylene Gas Now Moves in Large Quantities by Motor Truck

To determine in greater detail what carload traffic actually is moving by truck, a check has just been completed of the principal highways leading out of Los Angeles, which shows that, among many others, the following commodities are being truckhauled in such

Nails, spikes and bolts in kegs  
Iron pipe  
Hay  
Cotton  
Acetylene gas cylinders

Canned goods  
Gasoline in tank trucks  
Lubricating oil in drums  
Live stock  
Fresh meat  
Newsprint paper



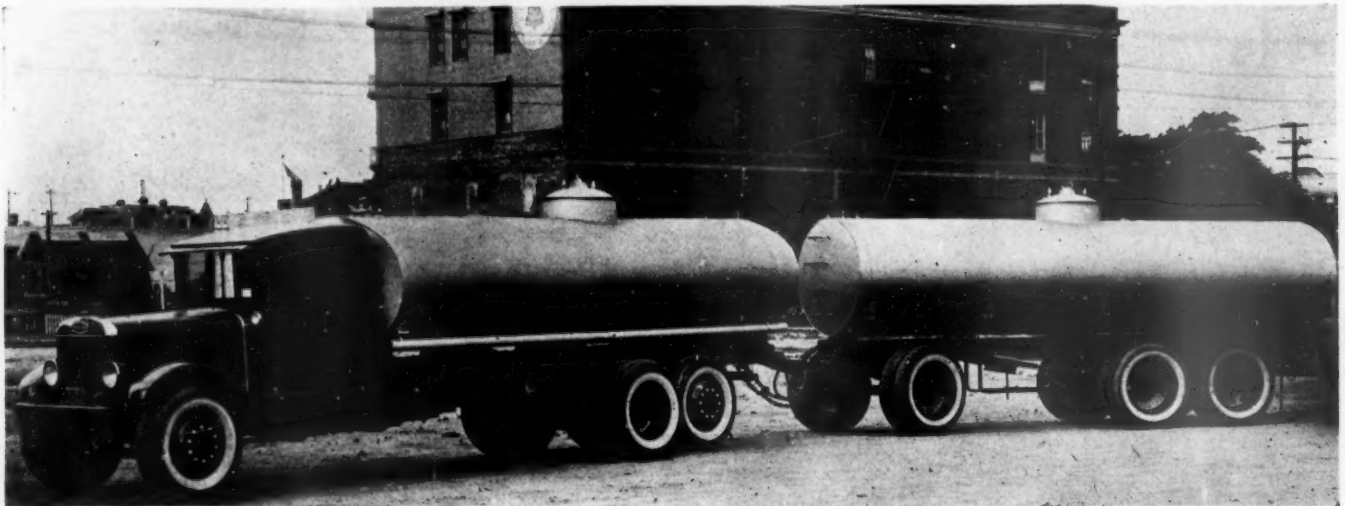
The Los Angeles & Phoenix Express Provides Daily Service Between Los Angeles and Phoenix, 470 Miles, and Los Angeles and Tucson, 502 Miles

volume as to suggest that serious losses are being suffered by the railroads:

Cement  
Lumber  
Structural steel

Fresh fruit and vegetables  
Grain

Every item in this list will readily be recognized as a commodity commonly moving in carload lots; and the check was made to cover only truck and trailer loads approximately equal to carloads. Illustrative of some



Truck and Trailer Hauling Gasoline from Los Angeles to Imperial Valley, a Round Trip of 400 Miles



of these loads are the accompanying pictures of typical truck and trailer loads. Acetylene gas cylinders, refined oil in tank trucks, and hay are only three of the many commodities of which the movement by truck for distances upward of two hundred miles is quite common. And as an example of a natural "carload" moving by truck, it would be difficult to find a more vivid illustration than that shown of a "double-load" of long-length pipe bridged across the full length of a truck and trailer.

The situation is not peculiar to the Pacific Coast. The practices in California merely are cited as typical of what observation has shown to be generally true in practically all parts of the country.

#### Changing Definition of "Carload"

The trucks, moreover, are changing the definition of a "carload." In railroad rates, the theory of the carload minimum of, say, 30,000 lb. is that the revenue upon any smaller quantity would not justify operating the car. In trucking, assuming a capacity load in each case, the profit to be earned from a small truck is about as great as that from a large one; and the truck operator, accordingly, stands ready to name the same rate for say, 10,000 lb. as for 20,000 or 30,000 lb.

The same principle prevails in the matter of mixed loads. In handling carload freight by rail, the car usually is switched to the load, and the shipper does the loading. To attempt to make up a carload by accepting, at the carload rate, three 10,000-lb. shipments from three different consignees on three different industry tracks, might be looked upon as involving so much delay and expense as to be prohibitive. The motor truck, being a self-propelled unit, and its driver being accustomed to doing his own loading, is not so handicapped. To the driver, it makes little difference whether he loads the entire 30,000 lb. at one or at three places; and the delay in making the three stops is trivial.

Under these circumstances, the truck operator may assume that in handling three 10,000-lb. shipments in 30,000 lb. capacity equipment, the burden upon him is no greater than in handling one 30,000-lb. shipment; and since he may offer, at the same rate, a 10,000-lb. instead of a 30,000-lb. minimum, the consignee is inclined

to favor the truck because of the opportunity afforded him to buy in smaller lots than are permissible under the 30,000-lb. minimum.

Largely the trucks are taking this traffic because they are charging less than the rail rates. Whether or not this is economically sound is beside the question. The fact remains that the trucks have cut and still are cutting heavily into the carload business of the railroads, just as, in an earlier day, they cut into the l.c.l. traffic. If, in his over-anxiety to attract business at whatever cost, an independent operator cuts his rates to a point so low that he goes broke, there appears always to be some one else to take his place.

This is a new and difficult form of competition for the railroads to meet. Railroads, being rather expensive to acquire, are not likely to fall into the hands of any one so unskilled in business as to make a practice of hauling freight for less than out-of-pocket cost. But motor trucks, being available for purchase by almost any one with the price of a "down-payment," frequently are owned by those whose sole training has been in the driving of the truck, with the result that sound business principles are not always the foundation of their freight rates. With proper legislation, this class of truck operator may eventually be regulated.

Rate adjustments by the railroads, even if it were practicable to make them, it appears would not exactly meet the situation. The railroads in a western state recently cut rates on hay in an attempt to recover the traffic from the trucks. The trucks again cut under the rail rates, and eventually, when the railways cut the rate to a point below which the trucks could not go, the trucks, borrowing a page from the history of the Dollar Line in the Orient, sent representatives into the fields and bought the entire hay crop in order to control the haul. It is not suggested, of course, that railroads should go to such extremes. But the point is made that the thing which the railroads might well be given by the various regulatory bodies to which they report, is whatever dispensation may be necessary to make the railroads, through the co-ordination of their rail facilities with motor transport, sufficiently flexible to meet truck competition as they find it.

\* \* \* \*



Pennsylvania Greyhound Lines Motor Coach at Pennsylvania Station, New York

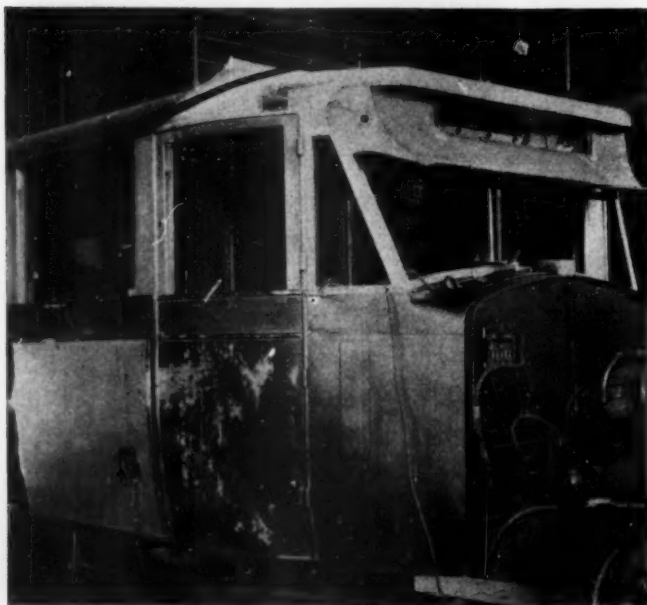


Engine Rebuilding Room

## Maintaining the B. & O. Train- Connection Coaches

*Twenty-nine vehicles, operating between New York and  
Brooklyn and trainside at Jersey City, are serviced  
by Fifth Avenue Coach Company*

**I**N giving a co-ordinated motor coach and train service, successful operation requires the maintenance of the highway equipment in such condition that it will have the utmost reliability with respect



Body Repairs Are Complete in Every Respect

to mechanical performance. Roadside delays and the holding up of train service, unless absolutely unavoidable should form no part of a railroad motor coach operation, if passenger confidence is to be built up.

The Baltimore & Ohio train connection service, operating between fifteen stations in New York, Brooklyn and trainside in Jersey City, has built up an enviable record in this respect. It is significant that no passenger riding in a B. & O. coach has missed his train connection since the inauguration of the service more than four years ago. The motor coaches meet 20 trains a day.

### One Make of Equipment Used

The equipment operated consists of 29 model Y Yellow coaches on which are mounted single deck bodies having a capacity of 21 passengers. To eliminate roadside delays as much as possible, the coaches have dual ignition allowing a quick change-over from one system to the other in the event of trouble. Each coach carries two starting and lighting batteries, either of which can be placed in operation by throwing a switch mounted on the dash. As the runs are comparatively short, with a considerable amount of waiting with the engine stopped at each end, a single battery would ordinarily become quickly run down. Most ignition failures are caused by wet or shorted induction coils, and these are also furnished in duplicate with a simple



and easily accessible knife switch control on the dashboard.

In cold weather, provision is made for heating the coach interior and the crankcase oil, by electricity while the coach is standing at the trainside or at the city terminals. This eliminates the usual uneven engine operation while it is warming up, and prevents damage to the engine through failure of the cold oil to flow. Two 600-watt heating coils, together with five heaters placed under the seats, are operated on a 220-volt A. C. circuit which is brought to the coach by a separate lead.

#### Fifth Avenue Coach Co. Maintains Coaches

When the train connection service was first considered by the Baltimore & Ohio, it was decided that the most desirable means of operating and maintaining the motor coaches would be to enter into a contract with an experienced operator who was already functioning in New York. The Fifth Avenue Coach Company was chosen, because this company was the largest operator of motor coaches in the city and had adequate garages, repair shops and a trained personnel immediately available.

When the service was inaugurated, the Fifth Avenue company provided garage facilities at 435 E. 47th Street, only a few blocks from the principal B. & O. motor coach terminal in the Chanin Building on E. 42nd Street, and organized a trained mechanical staff to take care of all cleaning and minor repairs. Major repairs and overhauls, including body and chassis work are made in the main shops located at 10 E. 102nd and 605 W. 132nd Streets.

#### Garage Personnel

The garage at E. 47th St. services the equipment of several other motor coach lines and the same mechanical staff handles the equipment of all of these lines. The force is divided into a day and a night shift, most of the repair work being done by the day shift. The night shift consists of a foreman, a road mechanic, a coach placer, a gas man and six washers and cleaners. The foreman, road mechanic, gas man and coach placer start work at 6:00 p. m. and the washers and



In Cold Weather the Engine Is Kept Warm by an Electric Heating Coil

cleaners at 8:00 p. m. The coaches are dry cleaned, if the day has been dry and washed if the day has been wet. The coach floors are mopped every night and the seats dusted.

The day shift works from 6:00 a. m. until 4:30 p. m. and is composed of a foreman and assistant foreman, an engine mechanic, two brakemen, one greaser, one electrician, one steering and clutch mechanic, one carpenter, and three floormen, who do cleaning and gassing.

#### Mechanics Specialize on One Type of Work

An important feature of the repair system is that each mechanic is a specialist on certain units of the motor coach. For instance, all engine work is done by specially trained engine mechanics and all brake relining or adjusting is done by the brake mechanics. The advantage of this system is that the mechanics become thoroughly familiar with the construction and adjustment of the units on which they have specialized, and can consequently turn out a better job in less time.



Train Connection Coaches Are Inspected Daily

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## FIFTH AVENUE COACH COMPANY

## DRIVERS REPORT AND GENERAL OVERHAUL SHEET FOR BUS NO. B-40 #6 TYPY

Speeds Reading 27876

P. 019

INSPECTION		DATE	DRIVER NO.	MILEAGE	SALE GAS USED	M. P. G.	WATER	OIL	REPORTS
<b>ENGINE, SUB-FRAME, STARTING HANDLE AND BOMMET</b>									
1. Run engine—see that there are no apparent oil-leaks; that engine and sub-frame hold down bolts are tight; that exhaust joints do not blow and that flexible exhaust piping is in good condition and properly secured; examine engine for cracks; clean crank chamber; examine compression.									
No. 1 No. 2 No. 3 No. 4 No. 5 No. 6 cylinders									
2. Clean carburetor and spark plugs; examine accelerator gear and throttle rods.									
3. Clean magnets. Examine leads, clip, tube and coupling.									
4. Clean and examine generator. Also voltage regulator and cut-out.									
5. Examine gas tank; clean gas filter. Examine gas pipe unions and rubber hose connection.									
6. Test coil and examine distributor, head and contact points.									
7. Examine radiator, fan, fan bracket, bolts, bearings, belt and bonnet.									
8. Replace all broken bonnet clips.									
9. Examine starting handle for casting, also bushes, jaw, and brackets.									
10. Examine foot boards; bonnet sills, and dash. See that all screws are firmly in place.									
11. Clean carbon from exhaust ports. See that flexible hose connection is replaced securely.									
12. Examine front license plate for rattling.									
<b>CLUTCH OPERATING GEAR AND COUPLING</b>									
1. Examine clutch operating gear, thrust race fingers, clutch shaft bushes, coupling, coupling covers, coupling flange bolts; see that coupling flanges are tight on keys.									
2. See that there is not too much and play in coupling shaft.									
<b>GEAR BOX, FOOT BRAKE AND CHANGE SPEED GEAR</b>									
1. Examine gears and bearings for wear; see that gear box is in line, that holding down bolts are tight, that gears are meshing properly.									
2. See that there is sufficient clearance in gate.									
3. See that change speed slides freely through gate and that the bushings are not unduly worn.									
<b>REAR AXLE, WHEELS, SPRINGS AND REAR BRAKES</b>									
1. Examine rear springs, spring brackets, holding down bolts, king bolts, shackles and shackle bolts. See that springs have sufficient camber.									
2. Examine wheels, ring and pinion gears. See that pinion work is in good order; that numbers are readable; that there are no bad cracks in spokes; that there are no stones between rear tires; and that all cuts are free from foreign substances.									
3. Examine rear axle shafts for possible defects. Examine shaft bearings; test worm bearings; see that flange is tight on worm shaft and that carrier bolts are tight. Examine for oil leaks.									
4. When removing brakes, see that there is no undue wear in brake cam bushings; that brake drums are in good condition. See that brake drum bolts are tight. When replacing wheels, be sure they are tight on tapered.									
5. Examine all tires.									
<b>FRONT AXLE, STEERING, AND FRONT SPRINGS</b>									
1. Examine front springs, spring brackets, holding down bolts, king bolts, shackles and shackle bolts. See that springs have sufficient camber.									
2. See that wheel numbers are readable; that wheels are in line; and that paint work is in good order.									
3. See that wheel bearings, nuts, and washers are in good order; that nuts are securely fastened; that pivot pins fit well, and that threaded ends are not worn.									
4. See that steering wheel has no backlash; that steering column bracket is tight on chassis frame; that steering lever on steering gear is tight on square; that steering balls, springs and nuts are in good order; that cross tube has no tilt; and that cross tube levers are tight in tapered and that all important nuts are pinned.									
<b>BODY, DESTINATION SIGNS, HEAT PIPES AND SCREENS</b>									
1. Clean heat pipes.									
2. See that body and cushions are thoroughly cleaned; body examined for projecting points likely to injure passengers or damage clothing; roof paint work cleaned; roof examined for leaks; seats inspected for general looseness. Examine pedestals for possible leakage and see that they are firmly secured to floor, and that there are no loose or missing screws.									
3. See that all belts and belt pushers are in good working order and that horn is in good condition.									
4. Examine lamp globes, switches, wiring and fire extinguisher.									
5. Examine heat pipe screens; see that there are no loose sections. Examine silencer and exhaust connections.									
6. See that sign and operating mechanism is in good working order.									
7. Examine windows for rattle. See that stairway screen clips are tight.									
8. See that all inside advertising signs are clean and in good condition. Examine deck advertising signs for possible loosening. See that upper deck wire screening is secure at all points, also that direct metal or wood points under screening are free from rattle. Examine upper deck seats for general looseness; see that there is clearance between seats and hand rails.									
<b>GREASING AND OILING</b>									
1. ENGINE—Bore oil in crank case; use engine oil.									
2. GEAR BOX—Fill up to cover by shaft; use gear oil.									
3. REAR AXLE HOUSING—Fill to within 1/2 inch of top of filler; use gear oil.									
4. Oil universal joints between gear box and rear axle; use gear oil.									
5. Grease clutch bushings, thrust race, and coupling shaft; use cup grease.									
6. Grease steering casing, pivot pins, and tie rod bushings; use gear oil.									
7. Grease front wheels; use cup grease.									
8. Grease front and rear shackle pins; use gear oil.									
9. Grease starting handle; use gear oil.									
<b>GENERAL R</b>									
Axle, Fru									
Clutch									
Engine									
Generator									
Magnet									
I am Satis									
Bus is In									
Signed									

②

## DRIVER'S BUS REPORTS

12-28 FORM 0434

## EQUIPMENT DEPARTMENT

Garage No. 7

Date Aug 28

1930

Run No.	Bus No.	Leave Garage	DRIVER'S REPORT
8			Left Hand Brake
30			Clutch Drag - Motor Knocking
5			OK
7			No Light on Dash Board
20			OK
23			Grease Front End also Brake Arms
31			OK
18			OK
25			OK
26			OK
14			Not in Service
19			OK
71			Put Gas in Manifold
93			Brakes will not hold, Pulling to the Right
15			Rattle under 3 floorboards
9			Clutch Sticking
16			Body Squashing - Not Pumping Oil
14			Air Pumping up to 150 lb.

③

## RECORD OF DELAYS

BADGE No.	RUN No.	POINT	TIME	MIN'S LOST	NATURE OF REPAIR OR ADJUSTMENTS
181	4	40th St. & Lex Ave	6:51 PM	5	Changed Coach

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FIFTH AVENUE COACH COMPANY  
ROAD MECHANICS REPORT

DATE 8-23 1930 DIVISION 7

BUS NO. 12 DRIVER

TIME NOTIFIED 10:52 AM AT BY

TIME LEFT GARAGE 10:53 AM DESTINATION 40th St. TIME REACHED

NATURE OF TROUBLE Engine stalled

TIME STARTED REPAIRS 11:37 AM TIME FINISHED REPAIRS 11:45 AM THE BUS CONTINUED OPERATION C.B.

REPAIRS MADE Dried Ignition

COULD DRIVER HAVE MADE REPAIRS? no

DID DRIVER MAKE ANY REPAIRS? no WHAT DID DRIVER DO TO OVERCOME TROUBLE? Telephone

TIME REPORTED BACK TO GARAGE 11:20 AM

THIS FORM MUST ONLY BE MADE OUT WHEN BUS IS STOPPED FOR MORE THAN 5 MINUTES

SIGNED J. Mac Kenney

## ④ CAREFUL INSPECTION MAY PREVENT AN ACCIDENT

FIFTH AVENUE COACH CO., N.Y.

BUS REPORT CARD

Bus No. 32 Date 8-29-30

THIS CARD MUST BE LEFT ON BUS ALL DAY

TIME	NATURE OF DEFECT	BADGE No.
12:24	Left Battery Weak Generator Not Charging Foot Brake J.K. when loaded will not hold when loaded	181

EVERY DR. AND CONDUCTOR WILL ENTER DETAILS AS TO ANY APPARENT DEFECT. IF NO DEFECT EXISTS, MARK O.K. IN DEFECTS COLUMN, ALSO TIME LEAVING BUS AND BADGE NUMBER IN COLUMNS PROVIDED.

BRAKE DEFECTS  
MARK X AGAINST DEFECT YOU WANT REMEDIED

	FOOT BRAKE	HAND BRAKE
Braking		
Equalizer		
Landing		
Sicking		
Squeaking		
Tighten		X

1. The General Overhaul Sheet Indicates All of the Mechanical Troubles Reported Since the Last Overhaul 2. The Daily Mechanical Sheet Summarizes the Operators' Reports for Quick Reference by the Shop Foreman 3. The Drivers Are Given a Total of 20 Minutes to Inspect the Coach and Make Out the Daily Report Card 4. Reverse of Report Card Showing Record of the Delay 5. All Road Mechanics' Reports Are Sent to the General Superintendent's Desk Daily



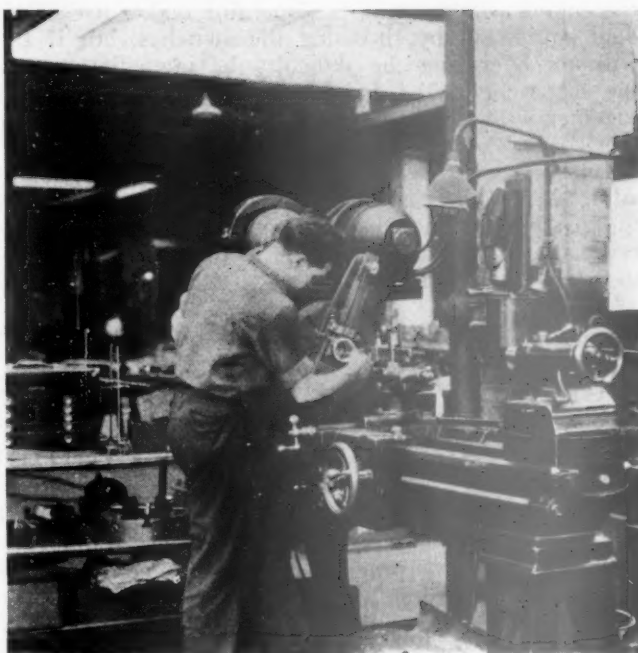
It occasionally happens that there will be no immediate work for a mechanic in his particular line. In such case he works as a helper, with some other mechanic who has more than he can handle, the regular mechanic being responsible for the satisfactory completion of the job.

A carpenter is available to make body repairs such as tightening loose screws, repairing seats, repairing floors, tightening fenders, etc. More extensive body repairs, are made at the W. 132nd Street garage where a complete body building and repair shop is maintained. If the necessary repairs are not extensive, an effort is made to complete the work in time to allow the coach to be used on its regular run the next day. An example of this is given in the replacement of broken windows or windshield glass. An outside glazing shop, located near the garage, keeps a record of the size of each window in the coaches and a telephone call, specifying which window is broken, results in quick delivery of a new piece of glass ready to be put in place.

Each coach is supplied with a report card, before it leaves the garage in the morning, on which the operators indicate any mechanical defects which seem to them to need attention. They are paid for 10 min. extra time, both at the beginning and at the end of their runs in order to allow them to give the coach an inspection and to report its mechanical condition as it appears to them.

When the coach has completed the day's work and is returned to the garage the road mechanic, on the night garage force, gives the coach a complete inspection, devoting particular attention to any defects reported by the operators. Using the same report card as a work card, he indicates the repairs which must be made before the coach is sent out the following morning.

To assist the night inspector and also the day repair foreman, the defects reported by the operators are written up on a separate mechanical sheet for quick reference. The foreman and the road mechanic on the night shift take care of as many of these running repairs as their time will allow, and the remainder are completed by the day shift, which reports for work before the earliest coaches leave the garage. Coaches which require major repairs or the replacement of



Boring Connecting Rod Bearings with a Lathe Fixture

units are held in and the repairs completed by the day force.

After each 2,500 miles of operation, the coach is held in the garage and a general inspection is made by the day inspector. At this time the wheels are removed and the bearings greased, the brakes are relined if necessary, the crankcase is dropped and the connecting rod bearings examined, the ignition and carburetion system thoroughly cleaned and all units either drained and refilled with fresh lubricant or filled to the proper level. A complete list of the inspection covered is shown on the general overhaul sheet. This sheet is a cumulative summary of all the defects reported since the previous general overhaul, and gives the mechanics a clear idea of the parts to be given special attention.

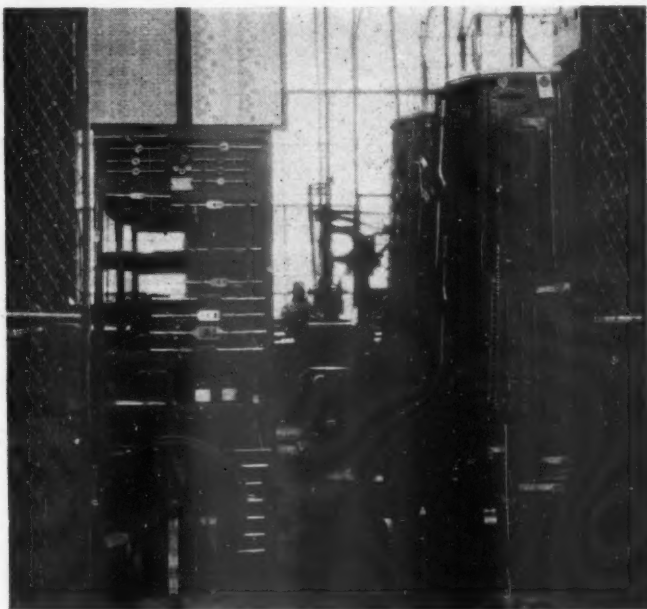
After the overhaul is completed, the assistant foreman takes the coach on the road and gives it a thorough test. If any further adjustments are needed, they are made at this time. The foreman is required to sign the overhaul sheet with a statement that all defects have been remedied and that the coach is in good running order.

A stock of replacement units is kept in the garage, including front and rear springs, electrical units, radiators, steering gears, rear axles and transmissions for both models of coaches used in the B. & O. service. If an engine should need to be replaced, an emergency which has not occurred as yet, the coach would be sent to one of the garages where facilities for this sort of work are better. All of these replacement units are overhauled in the E. 102nd St. machine shop, which is one of the largest and most completely equipped motor coach machine shops in the country.

If major repairs or other emergency demands for equipment require the use of extra coaches, the Fifth Avenue company has ample facilities for supplying them.

Annually, the coaches are given a complete overhaul. At this time the body is given close attention and all bent panels are straightened or renewed, the wiring is inspected and tested by an electrician, the window lifts are repaired, the seats are examined and the leather redressed, and floor linoleum is renewed if necessary.

The operators do not make any roadside repairs. If



All Tools Have a Place in This Tool Room

the engine will not run, the operator makes use of the dual equipment by throwing the switches, but if this will not overcome the difficulty he immediately calls the dispatcher, who arranges to send another coach together with a road mechanic, to bring in the inoperative coach.

In the event of serious mechanical trouble developing while the coach is enroute to make a train connection, the passengers and their baggage are transferred to taxi cabs, and sent to trainside in that manner in time to catch their train.

## Running Reconditioned Engines to Test Horsepower Output

**T**HE Motor Haulage Company, Inc., New York and Jersey City, N. J., for the last four years, has made a practice of putting every reconditioned engine through a dynamometer test before placing it in the truck chassis. The purpose of the test is to remove the initial stiffness of the newly-fitted bearing surfaces, and to locate mechanical defects or need of adjustments by comparing the horsepower output of the engine with the manufacturer's standard horsepower rating. The reconditioned engine must come within 8 per cent of this rating before it is passed for chassis installation.

The accessories, such as carburetor, magneto, or spark plugs, are adjusted or exchanged if lack of power indicates that they are not in the best operating condition. Faulty materials or incorrect fit of the parts can be detected before the engine is used in a truck, and serious road delays are thus avoided. Since these running-in tests have been made, there has been no case of a road delay caused directly by an engine improperly broken-in.

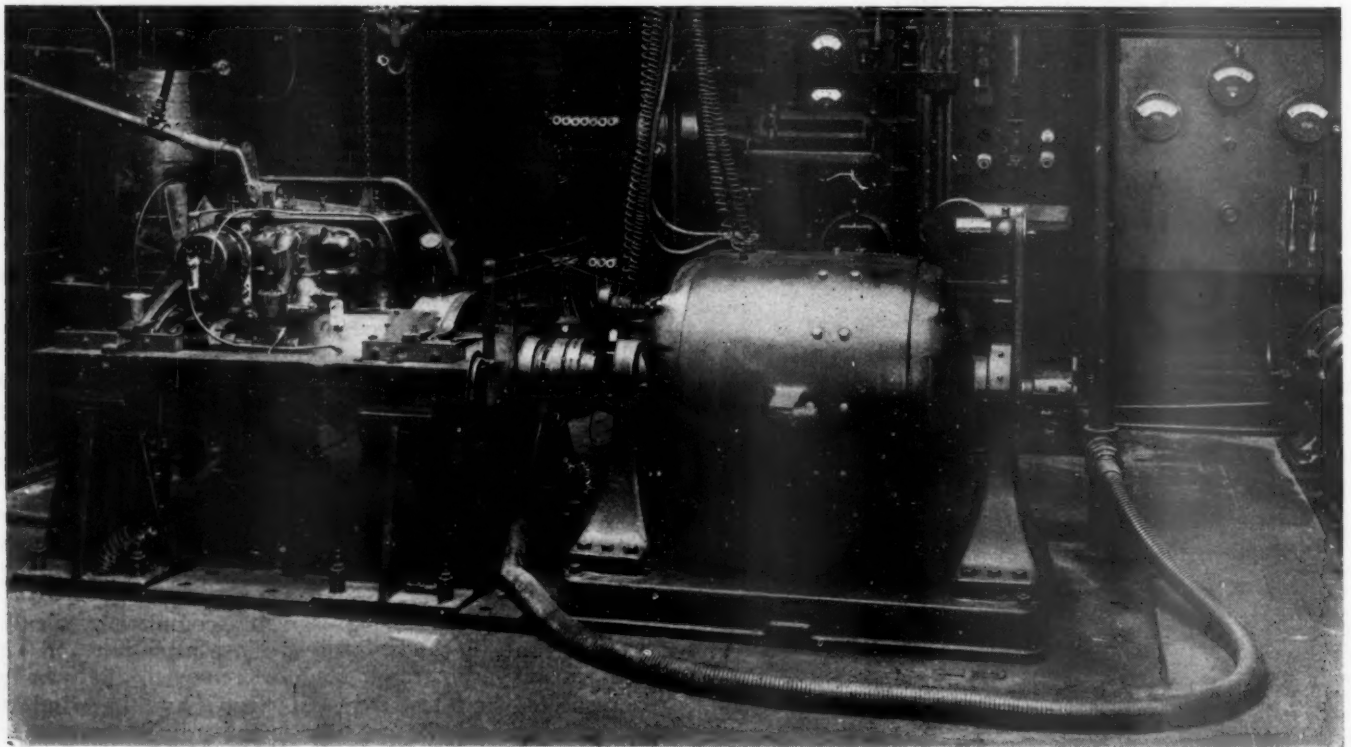
The engine is put on the stand with the carburetor

and magneto removed and the spark plugs screwed in loosely by hand. The level of the cylinder oil is brought up to a point where the connecting rods dip in about  $\frac{1}{2}$  in. This is done to provide an excess of lubricant to the cylinder walls and to cool any tight fitting bearing until a running fit has been obtained. The engine is then turned over by the dynamometer at about 350 r.p.m. for 2 or 3 hrs. depending on the degree of stiffness. The resistance to turning is measured by a scale on the dynamometer which will read approximately zero when the engine is thoroughly loosened up. During the running-in period, the tester frequently stops the machine and turns the engine over by hand to determine the amount of resistance more closely.

The carburetor and magneto are then installed and the engine is run under its own power, but without load, for 6 or 8 hr. During this period adjustments are made to the carburetor, magneto, spark plugs, water and oil pumps, valves and clutch. If no unusual noise has developed and the engine is thoroughly broken in, it is next tested for power output at 600, 800 and 1000 r.p.m., with full throttle opening. With the electric dynamometer the speed can be held constant while a reading of torque is obtained on the balance scale. The horsepower output is found by multiplying the lb. pull by the r.p.m. and dividing by 3000, a constant which includes the lever arm at which the torque is measured. The power test is run only long enough to obtain the output readings at the required speeds.

As the tester knows the required power-output of each engine, he can quickly find and locate the cause of irregular operation. Finally, the compression is tested and the governor is set at the rated r.p.m. No further adjustments are allowed to be made on the engine after it has left the test stand.

More than 100 engines have been tested and passed for installation after reconditioning, and none of them has yet been involved in a road failure for any cause which might have been detected in the dynamometer test.



Engine Test Stand and Electric Dynamometer



## Saving Money By

# Better Truck Operation

*Fleet managers find it pays to train operators  
in safety, courtesy and efficiency*

By H. R. Cobleigh

Motor Truck Department, National Automobile Chamber of Commerce

**U**SERS of fleets of motor vehicles have found that, entirely apart from the ethical consideration, the cost of training operators to be safe, courteous and efficient is more than repaid by what they save in reduced operating expenses, fewer accident claims, increased business by the promotion of goodwill, and in countless other direct and indirect ways, many of them hard to measure but certainly known to exist.

There is every argument, therefore, why those who may not have given much attention to driver training may well consider inaugurating such a program from the standpoint of its being a very profitable investment.

In the following are given suggestions developed from research into the practices of some of the most successful operators of transportation fleets. Some of them will be found applicable only to the owners of a considerable number of units, but others will be found practical for adoption by even the owner of five or less trucks.

Let it be emphasized, as referred to here, that operator training covers not merely the education of the new recruit, but is a continuing process aimed to keep the operators up to their best performance.

It seems to be a fundamental of all successful operator training systems to provide for careful selection of the raw material. Every employer hiring new men expects them to be already competent, or he expects to make them so. Naturally if they are not the kind that can be made into competent help, it is a waste of money to hire them at all; hence, considerable expense can be saved by a careful weeding out in the very beginning.

Without going into detail, the things about a man that

deserve investigation before it is decided to engage his services, are previous experience, reputation as to character, mental and physical fitness, home conditions and habits.

Generally, married men are preferred to single ones as being steadier and more responsible. One large fleet operator will not make an operator of a man who is less than twenty-four years old, its experience, before that rule was adopted, having indicated that most of the accidents were had by operators under that age.

Of course, the eye-sight should be good or made so

before a man is allowed to drive. His mental reaction also should be quick so he may be expected to do the right thing in an emergency.

Some will not hire a man unless he has been driving for at least two years. Fortunately everyone does not follow this rule, there being those who prefer to train their men from the beginning, else the new recruit could never get his two years' experience.

So far as expense is concerned, there is no preference between these two policies — hiring men already trained or teaching them to drive — for they start at higher wages if they are already trained, so that their training must be paid for either way. Not all have the facilities for conducting a school. Generally the smaller fleets have none, and such must depend upon getting operators who have had previous experience.

Space will not permit elaborating upon what an instruction course should cover. It will vary according to the nature of the service and the kind of business engaged in by the fleet owner. Many have to teach other details besides mere driving, which relate to the particular service of the company.

### Better Truck Driving Series—No. 1

## Poor Truck Driving Is Expensive!

**T**HOUSANDS of dollars of your money will be spent during the next ten years for taxes on your trucks and for insurance fees.

Good business management can stop leaks that will waste much of this money.

Although highways are being rapidly improved and motor trucks are being made better every year, the upward trend of truck taxation, of regulation and restriction of its size and weight, and of insurance costs, is mounting so rapidly that during the next decade many millions of dollars will be spent by the truck owners of this country over and above what they are now paying.

These expenses are increasing because the public is hostile to the motor truck.

Poor driving of trucks has created more of this hostility than any one other factor.

**MOTOR TRUCK COMMITTEE**  
**National Automobile Chamber of Commerce**  
366 Madison Avenue, New York

The First of a Series of Better Truck Driving Pamphlets  
Issued by the National Automobile Chamber  
of Commerce

Some give their operators considerable mechanical training, expecting them to get themselves out of their own road troubles. Others do not require operators to know anything technical about the truck except its control, making their inspectors and mechanics attend to its mechanical condition, and if a truck breaks down away from the garage, the operator must telephone for a repair man to come and get him started. In general, however, it is to be recommended that operators be taught at least enough about the mechanism of their equipment so that they can intelligently report disorders.

Opinions differ as to the teaching of rules; some lay down a good many and others almost none. The happy medium seems to be a short code that can be printed, and memorized by the operators. Some require the signing of a statement that the operators have done so before they will permit them to take a truck out. If rules are used, they should include attention to traffic signals and movements of other vehicles, as inattention causes most of the accidents; precautions to take on slippery streets; parking on hills; avoidance of speeding—to be consistent, owners must not give operators more to do in one day than they can accomplish without speeding; warning against contesting the right of way; insistence on clear signaling before making a left turn or backing; not following other vehicles too closely; and looking for the unexpected from pedestrians, especially children.

Some training can be done in groups or classes, but individual instruction is most effective and is recommended where at all possible. A certain amount of the schooling at least should be of this kind. It is hardly necessary to say that no operator should go out alone until he has been accompanied over his accustomed route for at least a day by an inspector. The inspector's report will show whether the man has learned enough to be entrusted alone.

The operator is only beginning when he has merely acquired the technique of driving. At this stage he is perhaps the safest operator he will ever be, for a novice has to be careful and knows it. One of the hardest things is to keep operators careful after they have become proficient. Over-confidence is worse than under-confidence.

There are two ways to keep operators up to a good standard of performance; granting rewards and inflicting penalties. The best systems use both to stimulate operators to carry out their instructions. There are various ways of rewarding good performance. Some prefer to give a monthly or other periodical bonus, and others prefer to give the reward in the shape of wage increases when salaries are reviewed. Either way, the things taken into account are freedom from accidents, a record clear of customer complaints, low expense for repairs on the vehicle operated, minimum of idle time, etc.

Poor performance is usually penalized by suspension or dismissal if the operator is incurably careless. A very good plan is to post records of the operators on a bulletin board, so that all may know how they stand and how they compare with others.

There are various auxiliary means of safety promotion, such as, the use of posters or printed safety lessons, etc. Either of these should be changed frequently enough so as not to become stale, the purpose being to preach safety in as many new guises as possible. Another excellent training auxiliary is the holding of meetings of drivers, to which, for example, police officials are invited to explain traffic regulations. Insurance companies or the local safety council usually

are glad to provide speakers for such meetings, as they are concerned with the reduction of accidents.

Fleet operators must realize and assume their share of responsibility. Nothing will demoralize an operator's performance more quickly than a feeling on his part that his employer is not cooperating with him. It has been mentioned, but it deserves repetition, that the driver must not be assigned to more work than he can accomplish safely in a day. It is of questionable advisability to give, as some do, a bonus for the number of deliveries made in a day above a certain standard. Such a plan is likely to cost more in accident claims than it saves.

Next to expecting only a reasonable amount of work from the drivers, the best cooperation that the employer can show is to maintain an effective inspection and repair department so that the equipment will be kept in good mechanical condition. Daily inspections are not too frequent, and a very thorough one should be made at least once a month or more often if the mileage warrants it. Mileage is a better gage of the necessary frequency of inspection than lapse of time. A mechanical history of each truck should be kept in this department, and if it is the rule, which is preferable where it is possible, that the operator always shall handle the same car, the record of repairs made on the truck will be an excellent index of the operator's performance.

Another way in which the employer can do his part is in his treatment of employees who have accidents. Reprimanding him, deducting from his pay, or punishing a man in any way for an accident for which he is entirely free of blame, will quickly spoil the spirit of all the operators.

Accidents should be studied with extreme care if the decision on them is to be just. Of course, records should be kept of all accidents, regardless of who is to blame, but only those for which the operator was clearly at fault should affect his bonus or salary.

Except for gross or conspicuous carelessness or a record of chronic recklessness, the operator should never be dismissed. Railroad experience has taught that the engineer who has just had an accident is the safest man on the road, the reason being that he has learned a lesson in caution that will last for some time. Discharging a man, for having an accident is sometimes not only unfair to him but is like throwing money away. The claim has to be paid anyway and the benefit of the lesson that the accident has taught should not be scrapped as well.

It becomes part of the employer's responsibility to study accidents over a period of time to discover, if possible, anything that he can do to reduce the number of those which stand out because of their frequent recurrence. Especially such accidents as are adjudged to have been avoidable should be made the occasion of bulletins or lectures to the men to teach them the necessary precautions.

It may be found that accidents are frequent in a certain locality. Where it is possible, routes should be changed to avoid dangerous sections.

Another practice that has proved profitable is engaging in general welfare work to make employees more contented, including provisions for the operators' comfort when off duty. It costs little and pays much in the way of safer and more efficient performance to have reading rooms, lunch rooms, occasional smokers or outings, group insurance or anything which helps to make the operator feel that his employer has a thought for him beyond the work he can get out of him.



# Preparations for Winter Weather

*Railway motor coach lines report on cold weather operating difficulties and means of overcoming them*

**O**PERATION in cold weather requires that extra attention be given to certain equipment on the motor coach, at this time of the year, if mechanical trouble is to be forestalled and a fair amount of comfort given to the passengers. These preparations, which, of course, only apply to fleets operating in the northern sections of the country, need not be extensive but they are important, if schedules are to be maintained and if the vehicles are to run in zero temperatures without mechanical trouble.

In response to a questionnaire, a number of railway fleet managers have outlined the special operating difficulties presented by cold weather, and described the methods which they use to insure comfort to the passengers and to prevent delayed schedules.

The first and second questions dealt with highway conditions, inquiring about the use of salt or sand to reduce the slipping hazard of ice-coated pavements, and whether separate snow plow equipment was available for emergencies.

Most lines depend upon the state, county or municipal highway departments to keep the highways open and in reasonably safe condition. The Samoset Company, Portland, Me., uses salt and hot sand on dangerous sections, and the Indiana Service Corp., Fort Wayne, Ind., spreads sand or salt by hand from a light truck on those sections of the highway which are considered hazardous.

Generally it is not necessary to maintain snow plow equipment, as most motor coach lines run over the primary highways which are kept open by the local highway departments. These departments usually have an abundance of equipment to take care of the removal of snow, due to the fact that but little reconstruction work can be done during cold weather.

Where separate snow removal equipment is found necessary, one of the most efficient units is a four-wheel drive truck fitted with a plow in front and a spreading scraper under the chassis. The Philadelphia Rapid Transit equipment, shown in the illustration, has a 4 cu. yd. steel dump body for carrying sand and a protecting hood over the scraper controls.



**On-Time Schedules in Winter Depend Largely Upon Keeping Highways Open**

There is some difference of opinion regarding the kind of body heater which is the most desirable. Undoubtedly, the hot water type is rapidly replacing the exhaust heating type. The New England Transportation Company has found the hot water type to give a comfortable interior throughout the winter, and is specifying this type on new equipment. The state of New York, effective January 1, 1931, is requiring that all coaches operated in the state be equipped with some form of heater which is not operated by the exhaust line.

The Reading Transportation Company, Philadelphia, throughout last winter, in its club-parlor coaches, used a double unit hot water heater in the front of the body and a single unit in the rear. For test during the approaching winter, a three-unit steam heater is now being installed.

The Fort Dodge, Des Moines & Southern Transportation Company, Boone, Iowa, has found the hot water type to be most efficient. One heater is placed at the front and one at the rear of the coach, with the connecting pipes insulated.

The coaches used in the Baltimore and Ohio train connection service in New York are equipped with five electric resistance heaters placed under the seats, which operate on a 220-volt circuit. When a coach is waiting at trainside in Jersey City or at the city motor coach stations, a rubber covered lead is plugged into the heating circuit from the city electric service and the coach kept warm regardless of the outside temperature. This provision was found necessary to give satisfactory service to the train connection passengers, who, after stepping out of a warm train, would quickly notice any change in vehicle temperature. The 220-volt circuit also heats the water in the radiator and the oil in the crankcase. This enables the coach to start up immediately, without the back firing and uneven running which sometimes occurs when the engine is cold.

Where the equipment is in reasonably continuous operation and is protected overnight by a heated garage, the use of anti-freeze mixtures seems to be unnecessary, provided the radiator is equipped with either automatic or manually controlled shutters.

The New England Transportation Company gives

close attention to the weather forecasts, and during extremely cold weather, alcohol is used, but during moderate weather no solution has been found necessary. The Canadian Pacific Transportation Co., operating in Ontario, Canada, does not use an anti-freeze mixture, and the Boston & Maine Transportation Co. uses alcohol only in coaches which have long lay-over periods.

The value of tire chains in deep snow or on ice coated pavements seems to be indefinite. A. C. Tosh, superintendent of the Reading Transportation Company, reports that tire chains are used only, in mountainous territory, and then on the outside dual wheels of coaches equipped with high pressure tires. On the most recently acquired coaches, equipped with 40 in. by 9.75 in. balloon tires, operating in average undulating territory, chains are not required.

G. E. Motz, of the Fort Dodge, Des Moines & Southern Transportation Co., finds that tire chains are neces-

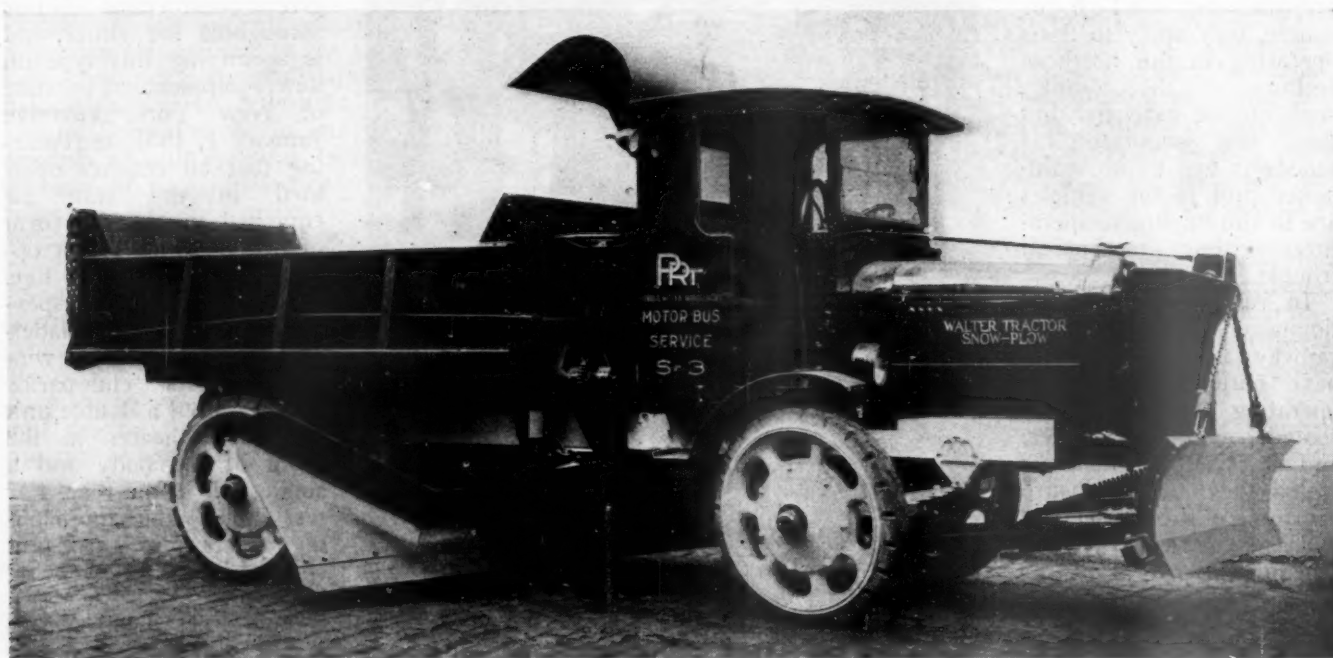
a result of heavy snow or ice, chains are ordered on.

"Operators of coaches on long-distance runs are made responsible for applying the chains enroute, if necessary. On long-distance coaches, a spare set of chains is carried.

"With highways glazed with ice our experience has demonstrated that it is not only practicable, but adds much to the safety of operation to apply a single chain in front. When possible this installation is made on the left front wheel, but when clearances will not permit, the chain is applied to the right front wheel. This has been found to avoid a large amount of front-end skidding which is otherwise liable to occur when conditions of glare ice prevail."

#### Special Preparations for Winter

Some of the mechanical equipment of the motor coach needs to be inspected and put in good working



A Four Wheel Drive Truck Chassis Gives Better Traction on Slippery Roads

sary in deep snow but on ice they are more or less of a handicap. Mr. Motz says, "Some operators prefer chains on ice while others seem to be able to handle their motor coaches much more efficiently without chains. In deep snow, chains are essential, but on ice I think it is optional with the operator. The Iowa state law compels us to carry chains but, to issue a fixed rule analyzing certain conditions under which chains should be used, would be unjust and out of line. A good operator knows when chains are necessary and will use them."

On the other hand, some fleet managers consider the use of chains necessary for safe operation. The Boston & Maine Transportation Co., the Samoset Company and the New England Transportation Company use chains extensively.

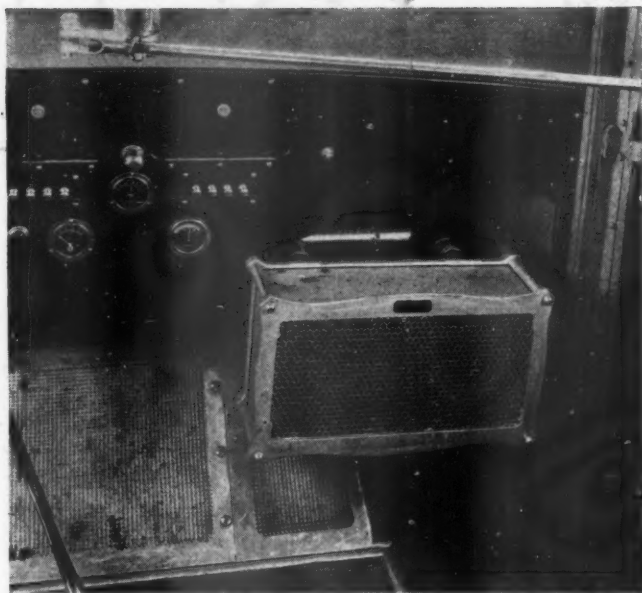
H. M. Walker, New England Transportation Company, says, "Due regard for safe operation requires the use of tire chains. A single chain applied to the outside dual wheel is standard, except on some of the older equipment where the dual wheel spacing is not sufficient to permit free play of the side chains. In this instance, a single chain covering both dual wheels is applied. The necessity for chains is decided by the operating superintendent, and when road conditions are bad, as

condition to assure trouble-free operation during cold weather. Exhaust heaters in particular need to be gone over to see that there are no loose joints which will allow fumes to escape into the coach. During the summer the pipes frequently become rusted through, allowing a small quantity of gas to escape when the heater is placed in operation. A good way to locate leaks in exhaust heating systems is to feed an excess of kerosene oil to the carburetor air intake while the engine is running and hold a block of wood over the end of the heating system. If there are any leaks in the piping the body will quickly become filled with dense smoke.

Hot water heating system needs to be thoroughly dusted, checked for leaks and placed in good working condition. Special attention should be given to the engine cooling system to see that it is free of rust and sludge and does not leak. Batteries should be in perfect condition in anticipation of a greater lighting demand and occasional starting difficulties.

To assure the best possible traction, the tires should have as good treads as possible. Brakes should be carefully inspected for proper adjustment, due to the greater tendency of a tight brake to make the coach skid under certain typical winter highway conditions. Under normal dry conditions, the brakes may give satis-





A Popular Type of Hot Water Heater

factory service when not closely equalized, but with the advent of slippery pavements, the added skidding hazard requires that all brakes be carefully adjusted.

#### Windshield Cleaners Need Attention

Windshield cleaners are a small item but they can have a great effect upon relieving hazardous driving conditions. Sleet on the windshield presents a difficulty which some fleet managers have gone to a great deal of trouble to overcome.

The Fort Dodge, Des Moines & Southern Transportation Company has developed an interesting device for keeping windshields clear. A double blower arrangement takes a small amount of air from the reserve tank and spreads it lightly on the inside of the windshield glass. A small electric fan is also installed, which can be kept in constant operation to give additional circulation to the air. The warm air from the inside of the coach, circulating against the windshield, will, in most cases, keep it fairly clear.



B. & O. Train Connection Coaches Are Kept Warm While Waiting at Trainside By 220-Volt, Resistance Type, Heaters

## Motor Coach Accident Prevention on S. P. & S.\*

By W. R. Sherman

General Claim Agent, Spokane, Portland & Seattle

**M**OTOR coach accident prevention is a subject which is now receiving a great amount of attention in all parts of the country, due largely to the rapid increase in highway travel. The operating conditions under which the various transportation companies are endeavoring to solve this problem are certain to play an important part; consequently, it is my desire to give a brief history of the company which I represent. During the early part of 1924, our company began the operation of motor coaches between Portland, Ore., and Seaside, a distance of 125 mi., pioneering in the operation of motor coaches, by a railway company, in the Pacific Northwest.

While the entire mileage was paved, this paving had a smooth black top which proved to be dangerous, especially during the rainy season. This highway, like those of other scenic sections, is made up largely of sharp curves where the view is obstructed, necessitating careful driving on the part of the operators.

Confronted with such conditions and also with the fact that the majority of the passenger car operators strenuously objected to the appearance of motor coaches on the highway, it was quite apparent that unless the coaches were operated on a safe and sane basis, our troubles would be many.

In the selection of drivers, only those of experience and possessing higher than average qualifications were accepted, and the majority of those originally accepted still remain in service. I believe that it will be conceded that the majority of accidents are avoidable and due to carelessness and, as a result, our company has found it necessary to enforce very rigidly such rules as: Strict compliance with all state, county and municipal laws and ordinances; making a complete stop before crossing railroad tracks or passing underneath overhead logging roads, remaining at a standstill in the latter case if logging trains or trucks are passing.

Operators are prohibited from smoking or conversing with the passengers while the vehicles are in operation. All fares must be collected before the coach leaves the station. Where conditions will permit, the vehicle must be driven off the pavement before loading or discharging passengers. The distribution of newspapers in bundles while the vehicle is in motion, is not permitted. Vehicles must not be abandoned by the operator with the engine running, but must be parked with gears meshed.

After passing points where road work is under way, the operator must bring the vehicle to a stop and examine the drain plugs of the crank-case, the transmission and the universal housing to satisfy himself that no damage has resulted from passing over loose rocks.

All vehicles are equipped with a supply of railroad fuses, and a driver, forced to stop after night-fall on a curve or at any point where the view is obstructed, for the purpose of tire change or other repair work, must protect his position by placing burning fuses at a safe distance to allow vehicles following to come to a stop.

All vehicles are equipped with first aid kits to be used in the event of injury to passengers or to give assistance where needed along the highway. Operators are not permitted to work more than eight consecutive hours nor more than ten in twenty-four hours.

\* From a paper presented at the annual convention of the American Electric Railway Association in San Francisco, June 23 to 26.

# Putting Equipment Where It Is Needed

*How the Greyhound Lines 638 motor coaches are assigned to their runs and stations—Economy depends on anticipating requirements*

By Glenn Johnson

Chief Dispatcher, Greyhound Management Company

**T**HE allocation or assignment of equipment to certain runs on the Greyhound Lines is determined by a number of considerations. The first consideration is the comfort of each passenger patronizing our service, and the second, that which pertains to economical operation.

That part of the Greyhound Corporation coming under the supervision of the Greyhound Management Company is engaged in the operation of 638 active coaches accommodating passenger traffic in the states of Ohio, Indiana, Illinois, Pennsylvania, Virginia, New York, West Virginia, Kentucky, Michigan, Maine, Vermont, New Hampshire, Missouri and the District of Columbia. Equipment for this territory is allocated from the office of the chief dispatcher, located at Cleveland, Ohio.

Greyhound equipment operated in the above mentioned states is of the six-cylinder type, seating from 29 to 53 passengers, and composed of various makes and types.

In allocating the equipment, an effort is made to assign coaches to runs where they will afford the greatest comfort for passengers. Coaches selected to operate on extended runs are equipped with reclining seats, foot-

rests, hydraulic shock absorbers, flexibly tempered springs, etc.

Proper allocation is of vital importance from an economical standpoint in that it tends to minimize dead-mileage, simplifies the maintenance procedure, and enables the company to secure greater mileage from its equipment.

Every dispatcher, regional manager, divisional superintendent and garage superintendent has a complete coach allocation list. This list gives the coach number, make, number of cylinders, passenger capacity, the states in which each coach is licensed, the division to which it is allocated, and whether it is a regular or an extra. When a coach is reallocated, a notice is immediately sent to every one possessing this list. As far as possible, numbers are assigned to each coach which will indicate the subsidiary company to which it is assigned. Often the coach numbers are changed when they are reallocated; however, all coaches retain their original serial numbers regardless of allocation.

A close check is kept on all extra equipment. When additional equipment is needed at one division point, a check is made of extra equipment assigned to nearby

Form 88-A BWS-430-03M 2071

DISPATCHER'S REPORT

OUT-IN

At \_\_\_\_\_  
(LOCATION)

Date

193

RUN NUMBER	SCHEDULED TIME		MIN. UTES LATE	Driver's Number	DRIVER	STATION	FROM TO	PASSENGERS	REVENUE	MILES	BUS NUMBER	Extra or Charter Buses Indicated by X	REMARKS
	A. M.	P. M.											
BUSES IN GARAGE NOT LISTED ABOVE													
REMARKS													
ABOVE SHEET CHECKED BY _____													

### Dispatcher's Report of Motor Coach Movements





The Greyhound Lines' Master Dispatch Board at Cleveland

divisions, and if certain coaches there are being used but little, and they are of a class suitable for the service desired, they are immediately transferred. The size of coaches required for certain runs is determined by an "off and on" report, which enables us to approximate the average number of passengers carried. The number of coaches allocated to operate on each division is, of course, determined by the volume of traffic handled and the number of schedules operated each day. The monthly revenue reports for the various divisions are scrutinized very closely, and the runs showing the greatest amount of revenue are usually given the best equipment. In some cases, however, better equipment is placed on a run where revenue should be better, or to meet competition.

Where it is necessary to operate coaches off of their regular division due to emergency cases, or for a short period of time, the allocation record is not changed. If the transfer is of a permanent nature, it is necessary to register the coaches with the various state public utility commissions, assign license plates, and change the records of the subsidiary companies, which hold the actual operating franchises.

#### Extra Equipment

As a protection against unexpected heavy travel or road failures, extra equipment is maintained at vantage points throughout the entire system. As an example, on the Chicago-Cleveland division, extra equipment is available at Toledo and South Bend. The distance from Chicago to Cleveland is 366 miles. Toledo is 120 miles from Cleveland, while South Bend is 154 miles from Toledo and 92 miles from Chicago. This spacing of extra equipment is a good average for the entire system. At no time is a coach more than two hours from a point where extra equipment is available.

The number of coaches allocated to certain runs or

divisions fluctuates more or less with the seasons. During the summer months, when traffic is heaviest, coaches in the best mechanical condition are assigned to regular service. A sufficient supply of extras is maintained at each point to take care of any relief or charter service that may be required. In this way, deadheading, or non-remunerative mileage, is reduced to a minimum.

In the fall when the summer rush is receding, coaches requiring extensive repairs are removed from their regular assignments and are placed in the garage to be put in first-class condition for operation during the following rush season. During the winter months, only the best equipment is allocated for regular service. Of course, a necessary number of extra coaches are kept in readiness in case of emergencies. The remainder of the fleet undergoes complete overhauling and is groomed for the coming season.

#### Maximum Mileage

One great problem is seeing that the coaches operate enough miles each day. Since schedules are changed from month to month according to the flow of traffic, this is a real problem. The schedules, particularly on the shorter runs, have to be so arranged that each coach assigned to the division will operate enough miles each day, and that the drivers will work long enough without their layovers being too great.

At Cleveland, our general dispatch board shows where every coach and driver on the system is operating. This board is changed from day to day to keep pace with actual operations. Brass-faced buttons are used to designate drivers, and nickel-faced buttons represent coaches. These are all numbered and are placed on the board in the section labelled with the name of the division to which they are assigned. This board also has an "in and out" record. For example, a coach and driver assigned to Chicago and placed on the run from Chicago to

Cleveland are placed in the "out" column while going to Cleveland. The next day, when the coach and driver make the trip back to Chicago, the buttons are placed in the "in" column. Each garage has a similar board, but which contains such information only for coaches and drivers assigned to routes operating out of that garage.

Dispatch sheets are made up at all points where coaches are assigned. These show the exact coaches used on all regular, double, charter and special runs each day, as well as the coaches undergoing repairs and on hand in the garage available for service. The sheets are promptly sent to the office of the chief dispatcher, where they are closely checked and the movement of each coach carefully scrutinized. Coaches that have been operated off their regular allocation due to emergency cases are detected and promptly worked back to their home region, thus avoiding excess deadhead mileage.

#### Average 208 Miles Per Day Per Coach

A tabulation is made each month to show the number of miles each coach is operated each day. Care is taken to see that the newer coaches are assigned to those divisions where they will get the most mileage each day. A monthly report of average miles per coach per day by divisions is also made. For the Greyhound Management Company, out of a total of 638 coaches, 415 are in regular service and 223 are assigned as extras. For the month of August, the 415 coaches operated a total of 3,386,742 miles, or 263 miles per coach. The 223 extra coaches operated only 787,082 miles, or 114 miles per coach, bringing the average for the system down to 208 miles per coach.

In order to facilitate the proper servicing, greasing, oiling, fueling, etc., each piece of equipment is designated as a "regular" or an "extra." As nearly as possible, all coaches are divided according to existing garage facilities, in connection with schedules. Where a coach terminates at both ends of its run in a company garage, one garage will be listed as taking care of heavy service and inspections, the other being responsible for light service and one-half of the greasing.

By heavy service is meant that the garage so designated will be responsible for the major work on that

particular coach. The garage at the other end will take care of the necessary light inspections, and only in an emergency will a unit be changed there. The heavy-service garage is responsible for all two-weekly inspections, complete greasing, oil changes, etc. By "one-half" greasing is meant only greasing the drive lines, checking the transmission and differential, and adding oil to the crankcase, air compressor and auxiliary oil tank, as designated on the washing, cleaning and storage report.

#### Economical Maintenance

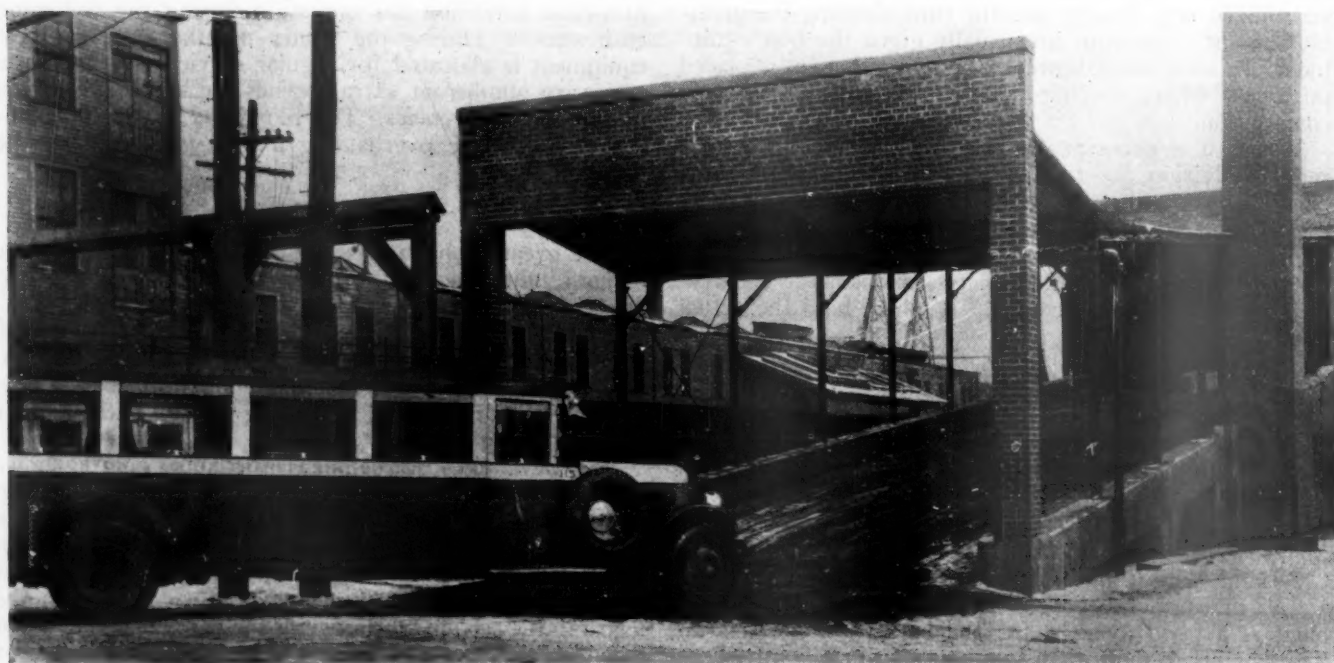
In this way, the maintenance department is able to know the exact number of coaches to be serviced at any one garage, thereby enabling them to regulate their working forces in an economical way. The operating and maintenance departments work together very closely in allocating all equipment to avoid carrying excess parts and maintaining unnecessarily large mechanical forces at outside garages. However, the allocation of equipment is under the complete jurisdiction of the operating department.

Where it is possible, coaches of certain makes are allocated to the same division, in order that replacement parts for that particular type of coach will have to be carried in stock only at that division.

Experience has taught us that coaches on regular runs have the capacity to run more mileage more cheaply than coaches run at random. Regular allocation guarantees a certain mileage daily. Following the same logic, it has been observed that if the same driver operates a coach day after day, he is inclined to acquire a greater personal interest in the appearance and condition of his coach, thereby inspiring greater care in its operation.

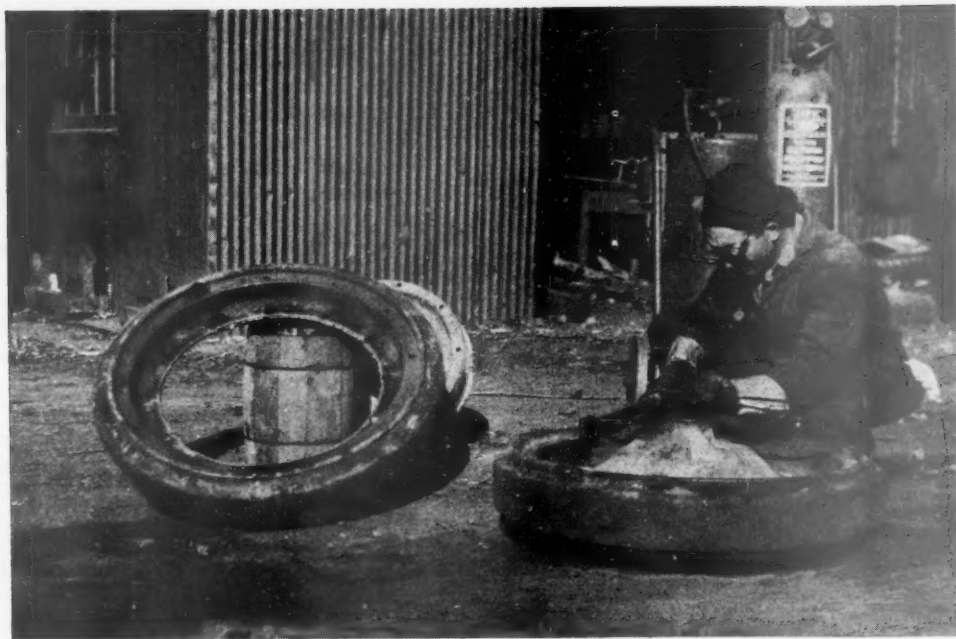
The occasional one-way trend of migration in certain sections has brought motor coach operators face to face with a grave problem—that of eliminating deadhead mileage. This situation can not be entirely corrected by the most careful dispatching, but proper allocation of equipment will partially avert this condition. Although a great many perplexing questions are encountered in following out our program, experience has taught us that proper allocation is by far the most practical for reliable and economical operation.

\* \* \* \*



Entrance to B. & M. Motor Coach Repair Shop at East Cambridge, Mass.





*The Cutting Torch Is Guided by a Jig to Produce a True Circumference*

*Using The*

## Oxy-Acetylene Torch

*in the Repair Shop*

*Many difficult repair jobs can be quickly and inexpensively accomplished by using the welding blowpipe*

By F. J. Fitz Gerald

Linde Air Products Co.

**M** AINTENANCE and repair, by means of the oxy-acetylene process, is a vital factor in the automotive industry. Particularly is this true in the motor transportation field where trucks and motor coaches are subjected to strenuous use and consequently need frequent repairing.

The scope of the usefulness of the oxy-acetylene welding and cutting blowpipe is wide spread in this field, for wherever metal parts need joining or severing, a welding or a cutting blowpipe is frequently the best tool to accomplish the job. From the front fender to the rear bumper, repairs seemingly impossible a few years ago, are now readily made.

Modern wheelwrighting by means of the oxy-acetylene blowpipe furnishes a striking example of this type of work. Recently the highway department of a western state acquired a number of army trucks equipped with solid rubber tires. The essential use for these trucks was with snow plows on state roads during the winter months. To clean a road, a plow was attached to the front of one truck, using a second truck as a pusher, the latter being equipped with spreader wings. The highway department found that the trucks should have pneumatic tires since these would give far greater

traction and much easier operation when plowing snow.

The proposed change was considered to be too expensive, as to purchase a set of new pneumatic-tire wheels would involve an expenditure of about \$120 a wheel. A welding foreman, who realized the possibilities of the oxy-acetylene process, suggested adapting the old wheels to pneumatic tires by welding and cutting. The experiment was thoroughly successful and the change has been made on twenty-five trucks.

The method has been systematized as follows: A jig holding a cutting blowpipe is attached to a steel plug made to fit the hub of the old style wheel. As shown in the illustration, this jig is centered to insure a perfectly circular cut which detaches the core of the wheel from the rubber-tired rim. As the jig is adjustable, the diameter of the core can be made to any desired size. After the cut is made, the old core and the new rim are carefully centered and tack welded to secure accurate alignment. Then the final weld, joining them together is made around the entire circumference of the inside of the wheel.

The heating torch can be used in straightening body dents or repairing cracks which have been caused by collisions or accidents. By the application of heat the



**Frames Can Be Welded Without Removing the Body or Units**

thin sheet steel can be shrunk, in many cases, to remove the dents without using either welding, hammer or solder. The use of a bumping hammer or mallet in connection with a sand bag or dolly block will correct large deep indentations. To shrink buckles or a large shallow dent, the heat of the oxy-acetylene blowpipe is used to bring the metal to a cherry red, then light blows should be made upon the heated part with a wooden mallet until the metal is cool.

Some repair men find that on very badly dented surfaces where no strength is required, filling the dents with solder saves much time and trouble. In applying solder, as much as possible of the paint in the vicinity is removed and a bar of solder is melted by means of a flame using only acetylene and air. The oxy-acetylene blowpipe can also be used for this purpose if desired, but some repair shops doing a great deal of body work prefer to use the more portable small acetylene tank and burner that is available. With this flame, the solder is flowed into the depression and a thick piece of cloth is used to wipe the filling material level with the con-

tour of the body. A file and emery cloth should be used also in finishing the repair. Solder adds no strength but acts as a good base for a smooth paint job. This method can also be used for making repairs to hoods.

When an accident has so badly damaged a portion of a vehicle body that it cannot be reclaimed, it is best to use the oxy-acetylene cutting blowpipe to cut out the faulty part, replacing it with a new section which is welded in place.

Posts which have become bent can usually be straightened by placing a jack between the bent post and the next straight one, and heating the bent one while the jack is being extended.

In making welds on automobile body parts, confining the heat to the section being repaired is very necessary. A paste for this purpose can be made up from asbestos fibre cement and water, and this should be spread over the area in the vicinity of the break, leaving just enough room to manipulate the blowpipe. This will keep the metal from buckling from the heat. When repairs are to be made on fenders, asbestos paper should be placed between the fender and the body proper.

Probably the most common use for the oxy-acetylene



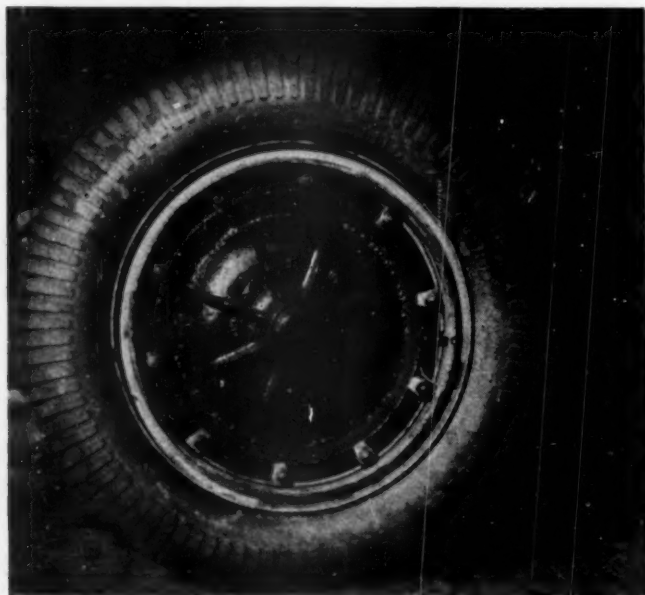
**Welding the Leg of an Engine**

welding process in automotive repair is that of welding cylinder blocks.

When welding was a comparatively new process, cylinder blocks were always removed from the chassis and placed in a preheating furnace and then welded with a cast iron rod. Today many cylinder repair jobs are performed by the bronze-welding process without removing the block. If the breaks are very serious, it is still best to dismantle the block from the chassis, preheat, and weld with the cast iron rod.

In preparing to make a bronze weld in place, the spark plugs and wires are taken off and all parts of the motor which might be damaged by the oxy-acetylene flame are protected by means of asbestos paper or asbestos fibre cement. Painted surfaces and wooden parts should be covered with this paste. All gasoline should be thoroughly drained from the gas line, vacuum tank and carburetor. The water circulation system should be drained well below the level of the crack, and the cooling system vented so that no pressure will be built up if the overflow pipe becomes clogged. It is a good plan to run the engine for a few minutes with the cooling system empty in order to preheat the casting slightly. This should be done carefully so that the engine may not be injured by overheating.

A diamond-point chisel should be used to chip out the crack to a depth of about 1/16 in. from the bottom.



**The Conversion from Solid to Pneumatic Tires Completed**



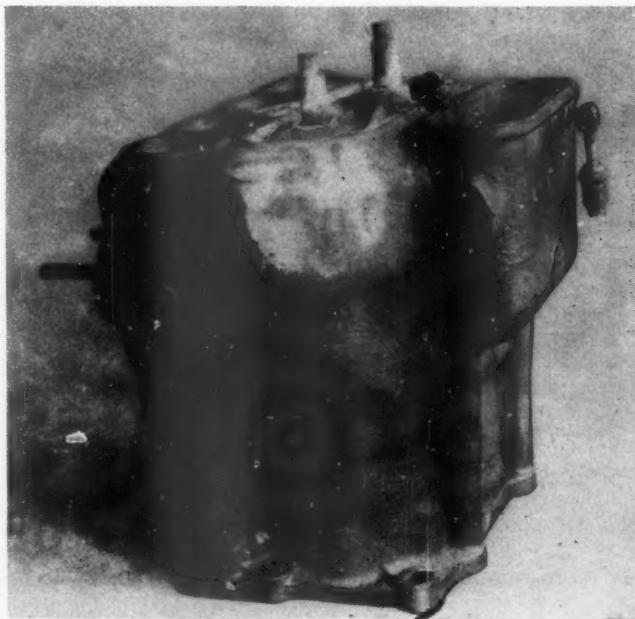
The vee should extend well beyond the visible end of the crack. Then the sides of the metal nearby can be roughed up with a chisel or file. A portable grinder is sometimes used for this work. The bronze will adhere much better to a clean metal surface. After chipping and cleaning of the vee has been completed, it should be washed with a little gasoline to be sure that all grease or dirt is removed.

A suitable flux and good quality bronze rod should always be used. A neutral flame and a slightly smaller tip than would ordinarily be used for the thickness of metal involved usually give the best and most efficient results.

The blowpipe flame should be played on the metal around the break, bringing it gradually up to the welding heat. To complete this gradual heating, the flame should first be directed on the surface for some distance around the break to expand the metal slowly so that the other parts of the block, away from the break, will expand and absorb a share of the contraction which occurs when the casting and weld are cooling.

The progress of the weld should be from the ends of the crack toward the middle. The weld should also progress from any small branch cracks toward a central point. The welding operation should be started well beyond the visible ends of the crack or break, because sometimes the fracture extends much further along on the inner surface of the block and if not completely welded, the parts may break again.

The metal in the vicinity of the crack is first heated gradually until it barely commences to glow. Some welders make a practice of testing the heat of the metal with water; if it bubbles or boils, the metal is hot enough to start welding. The knack in this operation consists in keeping the metal at this uniform heat, allowing it to get neither too hot nor too cool. If it becomes too hot, the bronze weld metal will boil and form into drops which will roll off; if the casting is too cool, the bronze weld metal will not form a strong bond to the edges of the vee. Good "tinning" is important. When molten bronze is applied to a clean fluxed surface, heated to the proper temperature, a thin layer of bronze will flow and spread out over the metal like water spreading over a clean, damp surface. Tinning is a most important consideration, for upon it rests proper adhesion.



The Finished Weld is Ground Off Smooth  
With the Casting



Putting the Finishing Touches on a  
Completed Weld

For the tinning operation, the end of the bronze rod is introduced into the flame while the casting is being heated, and the hot end is dipped into the can of flux, a little of which will adhere to the rod. The fluxed rod is then melted on the heated surface to be welded. After tinning a short section of the vee, the bronze weld metal is built up until it fills the vee and spreads over the surface of the block a short distance on each side of the section which has been chipped out.

After a cylinder block has been welded, it should be brushed with a wire brush to remove any excess flux. Grinding or filing will remedy any rough appearance, but it is preferable to leave the reinforcement in place if possible. Slow cooling is advantageous for bronze-welded parts. The bronze weld metal should not be subjected to any stress until the casting has completely cooled.

Trucks or motor coaches which have been in accidents usually have twisted or bent frames among other casualties. Because of the intense and localized heat of the oxy-acetylene flame, the blowpipe has come to be the chief instrument for straightening frames. In addition to the welding outfit, only four tools and a keen eye are ordinarily required to put the frame back in good condition. These tools include a 24-in. monkey wrench, a pinch bar, a sledge and a hand hammer. With these few tools, nearly any frame can be straightened and repaired so that it will be in as perfect alignment as it was originally.

The section that is bent most is first brought to a bright red heat, using a large welding tip, and straightened as much as possible with the sledge hammer and monkey wrench. It is then reheated and the twist taken out of it with the pinch or straightening bar and the monkey wrench, so that all parts are in line. It is then smoothed up and trued with a hand hammer, using the sledge head as a buckler.

The entire frame is straightened in this manner, the operator taking especial pains to get all parts exactly in line.

After it is straight, any torn places in the channel are oxwelded with steel rod, and a plate of the same thickness as the frame metal welded across the repaired break for additional strength.

The foregoing examples are but a few of the many automotive maintenance and repair jobs being performed every day by welders in the motor transport field.

## New Equipment

### Studebaker Brings Out Low-Priced 1½ and 2 Ton Trucks

**T**HE S. P. A. Truck Corporation, South Bend, Ind., announces two new Studebaker trucks of 1½ and 2 tons capacity, respectively, the first units of what will be a complete line of light and heavy duty commercial vehicles. The distinctive features of the new models are a six cylinder, 70-horsepower engine and a low chassis price.

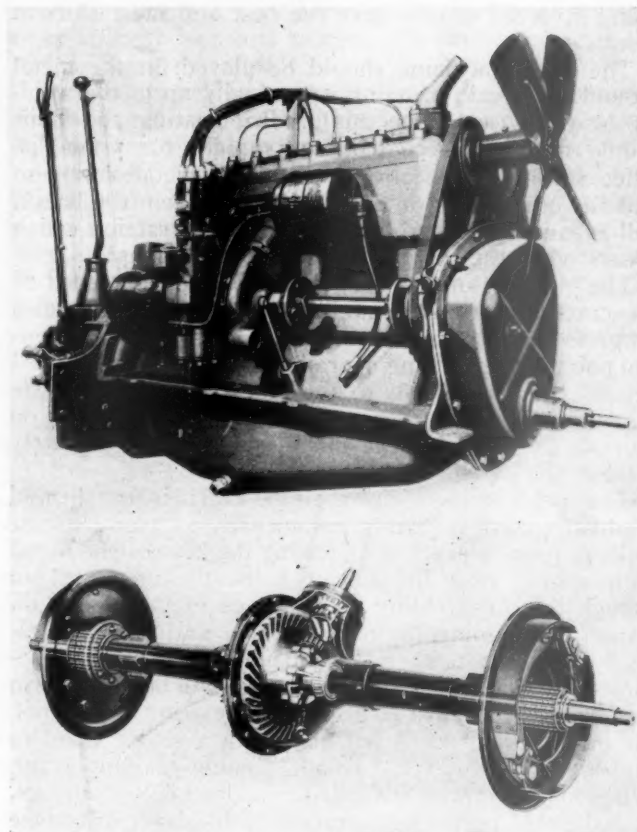
The 1½-ton chassis is offered in two wheelbases, 130 in. and 160 in. The engine has a displacement of 205 cu. in. and is equipped with a 1¼ in. plain tube carburetor connected to a swan-type intake manifold. The crankshaft is statically and dynamically balanced, and is supported by four main bearings having a total length of 9 in. The accessory shaft, which carries the generator, distributor and water pump, and the cam shaft are driven by a silent chain. At 40 miles per hour, the cooling water is circulated through the tubular, 3 1-8 gal. capacity radiator at the rate of 45 gal. per minute. The engine is supported by four brackets, those on the front end being cushioned in rubber.

The heavy duty, four speed, transmission has shafts and gears of special alloy steel. The front axle is of conventional design and has large spindles supported by Timken bearings. The Timken, three quarter floating, rear axle has a heavy pinion gear, straddle mounted, and large sized axle shafts. A back-up plate keeps the ring gear in full mesh at all times. Three ratios are provided: 5.64 to 1, standard; 5.14 to 1 for high speed, and 6.6 to 1 for heavy duty.

A Ross steering gear is regular equipment. The four-wheel, two-shoe-type Bendix brakes are cable-controlled, and have moulded linings for increased efficiency and longer wear.

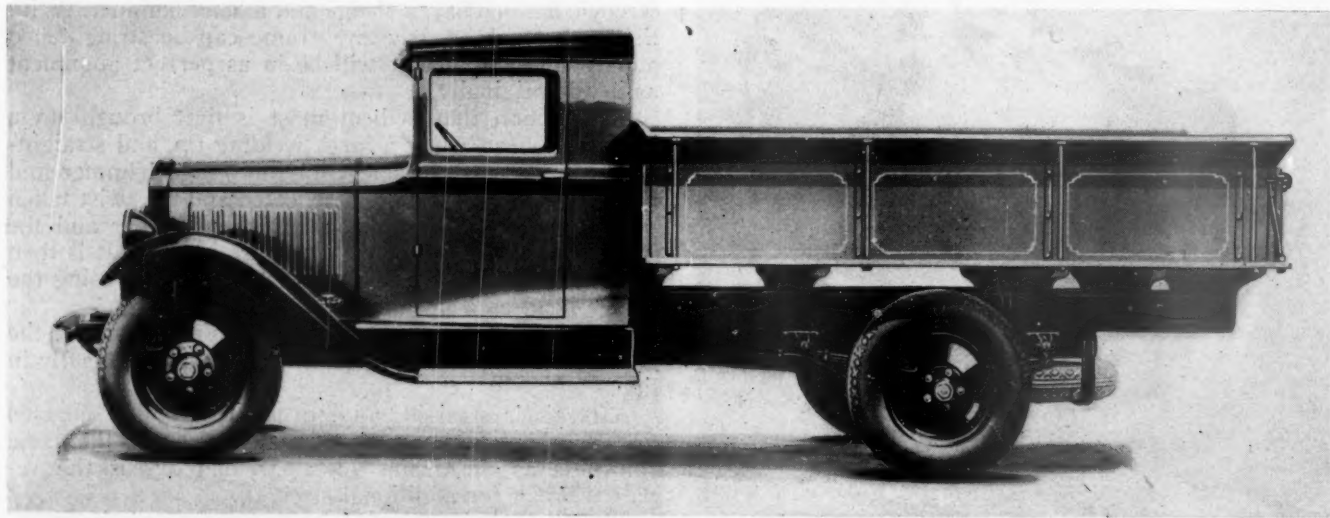
The 130 in. frame has 5 cross members and the 160 in. has 7 cross members. Auxiliary springs and dual wheels are available at extra cost on the 1½ ton model.

The Studebaker 2-ton truck is offered with two



Engine and Rear Axle Used in Studebaker 1½ Ton Truck

wheelbases, 148 in. and 160 in. The rear axle is a Timken, full floating type, especially designed for this chassis. Steel wheels, dual on rear, are standard equipment on this model.



Studebaker 1½ Ton Truck With Heavy Duty Express Body



Both models are furnished with steel cowl and front fenders. The front bumpers are chromium plated single bars, 5 in. wide. The instrument panel carries the speedometer, ammeter, gasoline gage, oil pressure gage and engine temperature indicator. The combination ignition switch and light control is mounted on the dash. The lights can also be controlled by an auxiliary foot button which permits the operator to change the headlight from long to short range without removing his hands from the steering wheel. De Luxe,

all-weather cabs are offered for both chassis, having narrow steel pillars for full vision, comfortably upholstered seats, and ample leg room.

A complete line of standard bodies is available, including panel delivery, screen delivery, canopy top express, open express, heavy duty express, platform stake, stock rack and all-steel dump types. The standard color for cab, cowl, engine hood and bodies is Chippendale Brown, while fenders and wheels are black.

## FWD Announces a New 7½ Ton Model

**T**HE Four Wheel Drive Auto Company, Clintonville, Wis., has begun production of a new 7½-ton FWD model known as the Super-Seven. The wheel base is 165 in., the loading space 156 in., and the tread 72 in. The heat treated, high carbon, pressed channel steel frame has side rails 10 in. deep by 3 in. wide by 11/32 in. thick, and is 34 in. wide overall. The chassis weighs 13,000 lb., and has a body weight allowance of 3,000 lb. The six-cylinder engine, with a bore and stroke of 5 in. by 5½ in., giving a piston displacement of 677 cu. in., develops 127 h.p. at 2,000 r.p.m. The cylinders are of the removable, cast-in-pairs, truncated, detachable-head design, while the cylinder heads have Ricardo-type combustion chambers. The crankshaft, with seven bearings, is supported by an aluminum alloy, girder type, crankcase.

The selective sliding gear, four speed, main transmission is supplemented by a planetary, two speed, auxiliary transmission; giving, in combination, a range of eight forward and two reverse speeds, with direct drive in the eighth speed. The outstanding feature of the new FWD, planetary, step down gear is that it permits the use of a 12 in. silent chain instead of a series of gears. In high range, there is a direct drive to the silent chain, with no moving parts in the planetary system, the entire unit rotating with the upper mainshaft of the sub-transmission as a solid flywheel keyed to the shaft. The design permits of removing the entire planetary

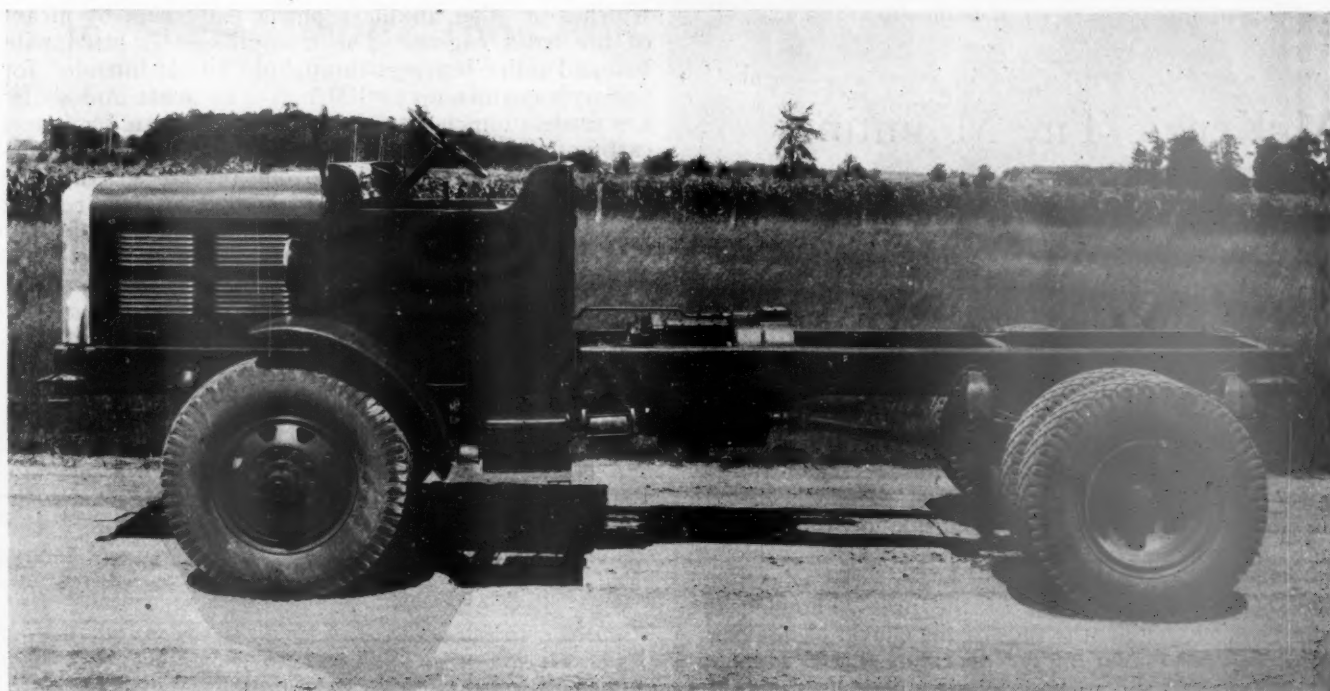
system without disturbing the propeller shafts, the silent chain or the sprockets.

To provide an ample road clearance of 15 in., full floating, double reduction axles are used on both front and rear, the first reduction being through a pair of bevel gears and the second reduction through spur gears. All gearing is enclosed, protected from grit and dust, and runs in a bath of oil. The front and rear axle shafts are 2½ in. in diameter.

The new steering arrangement of the front axle gives greater steering ease. The entire front-axle load is carried on two large tapered roller bearings at each axle end. They are tightly encased by positive oil seals to retain the lubricant and to prevent the intrusion of water and grit. The trunnion bearings are adjusted by laminated shims between the covers and the sockets. The universal joints of the front axle shafts are lubricated through the rifle boring in the outer axle shafts by means of grease fittings in the wheel hubs. Positive closing of the bearing ends prevents centrifugal action from throwing grease out of the bearings.

The new roller mounted cam and lever steering gear, together with the 22 in. steering wheel, carefully located, provide the operator with passenger car steering comfort.

The center differential, a distinctive feature of all FWD trucks, which compensates for the difference, under certain road conditions, in the rotation of the



Four Wheel Drive, 7½ Ton Truck

front and rear axle shafts, is interposed between the front and rear propeller shafts. This differential is of the standard four-pinion, bevel gear type with a jaw clutch on the hub of the differential case. When the operating clutch of the front jack shaft is engaged with the jaw clutch of the differential case, all center differential action is eliminated. The locking clutch is worked through a pedal near the clutch pedal in the cab.

The service brakes, operated by air pressure on the rear wheels only, have drums  $4\frac{1}{2}$  in. wide. A four-shoe Tru-Stop brake, mounted on the hub of the upper transfer case sprocket, exerts, through the driving mechanism, a positive braking action on all four wheels.

The semi-elliptic, alloy steel springs are 48 in. long and  $3\frac{1}{2}$  in. wide in front, and 52 in. long and 4 in. wide in the rear. Standard tire equipment includes 44 in. by 10 in. pneumatics, single on front and dual on rear.

## Chevrolet Announces An Improved $1\frac{1}{2}$ Ton Truck

**C**HEVROLET Motor Company, Flint, Mich., has recently introduced several improvements in its  $1\frac{1}{2}$ -ton truck, the most important of which are: dual wheels as optional equipment, heavier rear axle fitted with larger brakes, pressed steel wheels, and internal expanding, 4-wheel, articulated shoe type brakes. The dual wheel equipment is of pressed steel web design, interchangeable front and rear, with 30 in. by 5 in., six-ply, truck-type cord tires as standard equipment. The dual wheels, it is said, give better traction on sandy or soggy soil.

The larger rear axle is of the semi-floating type with spiral bevel gears and axle shafts  $2\frac{5}{32}$  in. in diameter. The brakes are weatherproof, fully enclosed, and have 16 in. drums on the rear. The one-piece, channel type frame has been strengthened where the stress is greatest. The new chassis is built complete with a cab and a choice of thirty-six types of bodies is available.

## McKenzie Tire Mounting and Demounting Machine

**A.** C. Burleigh, 80 Boylston St., Boston, Mass., has developed a new type of tire mounting and demounting machine known as the McKenzie Tire Press. It is claimed that pneumatic motor coach and truck tires can be mounted or demounted in much less time than was formerly required for this work, and that it can be done easily and safely, without harm to either the press or to the tire and wheel. The construction of the press makes it unnecessary to do any heavy lifting when removing a tire. The wheel, with the deflated tire, is rolled alongside of the machine and the tire supporting frame tilted from a horizontal to a vertical position until the hub of the wheel will pass over the chuck pilot of the press, allowing the wheel to lean against the face of the chuck. The operator then pulls down on the operating shaft, swinging the tire and wheel up into a horizontal position. The wheel hub is then clamped down and the pressure arms



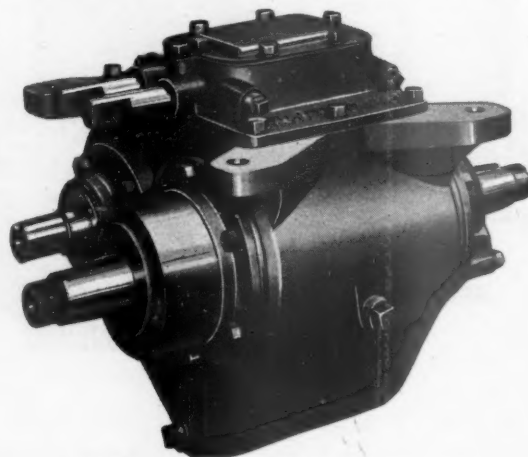
Shoes Pressed Against Bead-ring of Tire to Release or Insert Locking Ring

are swung into position. By rotating the operating wheel, the tire is forced against the pressure arms until the locking ring is released. Movement in the opposite direction withdraws the wheel from the tire.

After the new tire has been mounted, the pressure arms remain in place until the tire has been fully inflated, acting as a safety guard so that no accident can occur due to a faulty or improperly placed locking ring.

## Power Take-Off Transmission

**T**HE Wichita Falls Motor Company, Wichita Falls, Tex., has developed a split propeller shaft, power take-off transmission for operating power winches or other auxiliary power equipment by means of the truck engine. The transmission is fitted with ball and roller bearings throughout and is intended for use with engines up to 100 hp. The gears and shafts are made of nickel steel and the case is a semi-steel casting. Operated in the take-off position, the transmission has one forward and one reverse speed. The forward speed has a ratio of 1.17 to 1 and the reverse



Wichita Falls Split Propeller Shaft, Power Take-Off



speed 1.37 to 1, in relation to the main shaft rotation.

The internal gear-type clutch, connecting the front and rear main shafts which control the vehicle movement, operates entirely independent of the power take off, thus permitting full use of the take-off with the vehicle either moving or stopped.

The parts are designed so that the unit can be assembled with the power take-off shaft on either the right or left side of the main shaft and with the driving sprocket either to the front or rear of the case. Provision is made for installation of a speedometer drive gear. The transmission has small outside dimensions to allow it to be easily installed.

## Bosch Direction Indicator

**T**HE Robert Bosch Magneto Company, Inc., Long Island City, N. Y., has brought out an illuminated direction indicator. The device, which is operated by a switch mounted on the dash, consists of two semaphore arms, one mounted on the right and



The Semaphore Arm  
Is Illuminated

one on the left side of the windshield. When the operator wants to make a left turn, he throws the switch to the left side, and the arm is raised and illuminated by a bulb located within the casing. An automatic time switch is provided which holds the arm extended for about 10 seconds after the switch has been released, giving

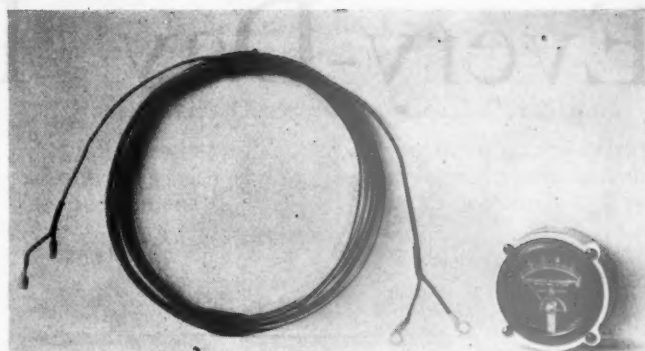
ample time to make the intended traffic turn.

## Engine Temperature Indicator

**T**HE General Electric Company, Schenectady, N. Y., has developed an engine temperature indicator which operates on the thermocouple principle. The type DO-18 indicator measures the temperature of cylinder heads, cylinder walls or other points. It is practically instantaneous in operation and gives a quick indication of heating and cooling. Most engine temperature indicators show the temperature of the lubrication oil or cooling water. These give only the general thermal condition of the engine and are of practically no value in the detection of hot spots.

The complete indicator consists of a thermocouple, twin conductor lead and an indicating instrument. Two different forms of thermocouples are optional, one consisting of a pair of  $\frac{1}{8}$  in. copper bushed studs to fit drilled holes, and the other in the shape of a washer which can be placed between the spark plug and the cylinder head or under a cylinder head bolt, the same as a gasket.

All corrections for air temperature are made automatically by the instrument itself by the use of a special metal which has a peculiar property whereby its magnetic properties change with temperature changes. Placed in the magnetic circuit of the instrument, it is affected by the same air temperatures as the leads and



Thermocouple Type Temperature Indicator

counteracts the errors which would otherwise be introduced.

No battery is required as the thermocouple generates its own electricity in proportion to the temperature to which it is heated.

## Electric Body Polisher

**B**LACK & DECKER, Inc., Towson, Md., has brought out a portable electric body cleaning and polishing tool which is designed particularly to clean off the film of road dirt and oil vapor, which body surfaces gradually accumulate, and to apply and rub down a protective coating of hard wax. Special cleaning and waxing compounds have been developed for use with this machine, which give better results than similar products intended for hand application.

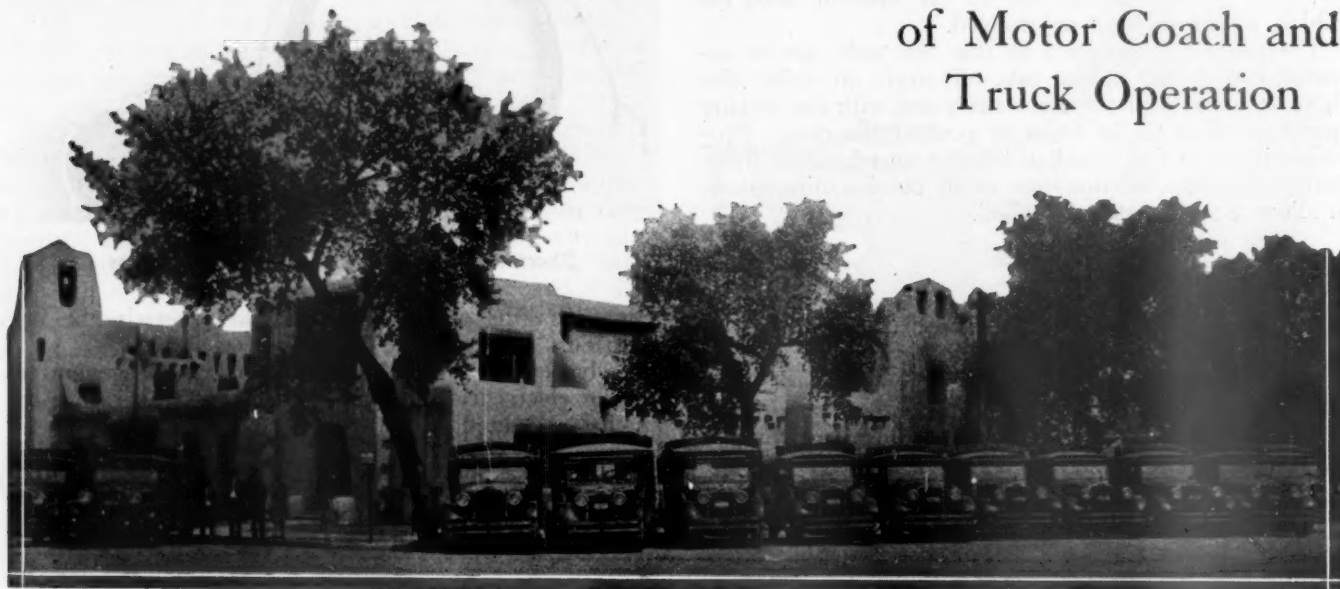
The swirling action of the polishing machine rolls the dirt film completely off, it is said, without harm to the finish and applies a hard coating of wax which is made more durable by the burnishing action of the machine. The tool is equipped with a lamb's wool polishing pad, and weighs  $8\frac{1}{2}$  lb.



Black & Decker Cleaning and Polishing Machine

# Every-Day Problems

of Motor Coach and  
Truck Operation



## This Month's New Questions

### Question No. 32

#### Buying Motor Coach Equipment

*"To what extent do you specify the kind of parts, equipment and accessories which are to go into the new motor coaches and trucks which you purchase? In your opinion, is it better to draw up detailed specifications for motor coaches and trucks to be purchased, or to accept the standard products of the manufacturers? Why? What particular items of equipment, apart from those which are standard, do you specify in ordering new coaches and trucks?"*

### Question No. 33

#### Motor Coach Depreciation Fast or Slow?

*"What method of estimating depreciation on your equipment—for accounting purposes—did you adopt when you began motor coach operation? How have your original estimates checked with your actual experience in operating and wearing out the equipment? In what ways, if any, have you changed your method of figuring depreciation for accounting purposes since the beginning of operation? What do you now consider the most accurate basis of charges to be made for depreciation?"*

## What Is Your Answer?

### Reply to Question No. 29

#### A Uniform Breakdown of Operating Costs

*"What system is used in breaking down total operating costs in connection with motor coach and truck operations? What items are shown in such analyses, and what elements of cost are included in these items?"*

*What uniformity or lack of uniformity has been noted in the basis for arriving at operating costs used by railway motor coach operators? What considerations favor the adoption of a uniform system of cost analysis by motor coach and truck operators?"*

#### Pacific Greyhound Methods

In general, our detailed costs are divided into two classifications: (1) Cost of maintenance and rebuilding automotive equipment; (2) statistics of gasoline and oil consumed.

The underlying records for accumulation of maintenance and rebuild costs are the labor time card, material



requisition and credit memorandum (for material released); and for gasoline and oil statistics, a form reflecting gallons of gasoline and quarts of oil issued to individual motor coaches. The above records are broken down by the medium of the Hollerith tabulating machine.

The necessary information for costs, such as coach number, classification of repairs, hours and money, are punched on cards sorted to car and classification of repairs, and accumulated in statement form on tabulators.

Maintenance and overhaul costs are broken down into eight general classifications, such classifications governing labor distribution and material issued and released. These classifications are as follows:

Repairs to—Motor  
Chassis  
Body  
Brakes  
Drive Line  
Electrical  
Painting  
Tires and Tubes

In addition to the above, classifications are assigned for supervision, cleaning and washing, inspecting and all other general items of labor or material that would occur in a repair shop or garage. No effort is made, however, to break down the latter classification to individual motor coaches or trucks. A statement is issued, however, showing the first eight classifications of repairs by individual motor coaches.

The basis of obtaining cost statistics covering repairing and rebuilding automotive equipment is motor coach mileage. Gasoline and oil statistics are also based on miles, the result being miles per gallon for gasoline and miles per quart for oil. I believe that the above bases are well established in all motor coach operations. However, the method of accumulating, and the extent to which such costs are segregated, are no doubt governed by local conditions and the information required by the operating officials of each company.

A uniform system of costs would no doubt be of great value to the motor coach executive, in that it would enable intelligent comparisons of maintenance costs and serve as a guide for the placing of proper automotive equipment to meet the particular operating conditions. Uniform maintenance costs should also be of value to coach and truck builders as a guide for pointing out weaknesses in equipment, which can then be corrected.

T. B. WILSON,  
President, Pacific Greyhound Lines.

### Reply to Question 30

## Motor Coach Traffic and Fares

*"What is the present per-mile basis of your motor coach fares? Is this lower or higher than a year ago? How does your rate compare with those of your competitors? Is the trend of fares toward higher or lower levels in your locality? How have reduced fares or special excursion fares affected the volume of traffic? Is enough additional traffic secured to increase the gross revenue? If so, has the increase in revenue been accompanied by an increase in expense? If motor coach*

*fares were to be standardized, what in your opinion would be a reasonable rate?"*

### Fare Levels Governed by Local Conditions

It is somewhat difficult to answer the question of fares inasmuch as with a view towards economy, our accounting department does not accumulate a record of "passengers carried one mile." Therefore, we have no figure showing the weighted average rate per mile.

On all of our intrastate routes, the motor coach rates are identical with the one-way rail fares, and between intrastate points not common to the line of our parent company, the fares are made at 3.6 cents per highway mile. Thus, on all intrastate traffic, we nominate a fare that would yield approximately 3.6 cents, and this has been the practice since the establishment of the New England Transportation Company.

On interstate traffic, inasmuch as we entered the field after numerous independent lines had already been established, we adopted the fares of our interstate competitors, which yield varying rates per mile; i.e., from 1.7 cents to 3.6 cents per mile, depending upon the territory served, the volume of traffic, etc.

Fares on all but five routes, the latter being interstate routes, are identical with those existing in 1929; and on these particular five routes referred to, we have reduced our fares to the level of interstate motor coach competitors. However, there are numerous cases where our interstate motor coach fares are greater than the fares prevailing on interstate seven-passenger cars, the operation of which is extensive in Southern New England. The trend of interstate fares in the immediate past has been downward. Whether or not this will continue is, of course, uncertain.

Reduction in fares, particularly during these times of economic stress, has tended to increase the motor coach riding. It is probable that substantial reductions in fares would have the effect of stimulating riding, but whether or not the net result would be an improvement in net earnings is questionable, and depends entirely upon the density of traffic, the capacity of the vehicle, and the operating expenses. Our experience on one of the interstate routes upon which a reduction was made has shown a tremendous increase in traffic, and as the particular route operates between dense traffic points, it is probable that the net earnings on this service will be greater than those obtained under the high rate structure.

What might be considered a standard rate for one company would not be at all applicable for another. Various features which are not comparable enter any such consideration. If a company is forced to support the drain of lightly patronized, short-haul routes, double-heading in peak hours on short routes, is confronted with high terminal charges, etc., an entirely different rate structure will be necessary than that which might prevail on a dissimilar operation. For this reason it is difficult to even approximate a standard rate without an exhaustive analysis.

H. PRICE,  
Passenger Traffic Manager,  
New England Transportation Company.

### Greyhound Rate 2.8 Cents Per Mile

The present basis of our motor coach fares is 2.8 cents per mile. This is the same as a year ago. Our rate is slightly higher than those of competitors, in most cases. The trend of fares is toward higher rates in the case of local or intrastate service and lower rates in the case of interstate long distance service. Reduced

fares and special excursion fares have increased the volume of traffic.

Motor coach fares are based on the volume of traffic, operating costs, competition, etc. Inasmuch as these three elements are quite difficult to standardize, it is likewise difficult to standardize the fares. A rate around three cents per mile would be nearest on interstate service.

J. B. WALKER,  
Sales Manager, Greyhound Lines.

### Reply to Question 31

## Tires—Purchase or Contract?

*"Do you buy your tires outright or do you have a contract with a manufacturer to supply tires in return for payment on a mileage basis? Why? If you own your tires, what is the extent of your tire repair organization? If you contract for tires, what have you done to eliminate the necessity of paying extra charges due to drivers' running tires flat? How many miles do you average between roadside delays caused by tire trouble? Do your coaches carry more than one spare tire? What proportion of your total operating cost per mile is represented by tire cost? Is tire expense increasing or decreasing?"*

### Contracts for Tires

Tires for our company are handled on a mileage basis by contract. The only means we have found to eliminate paying extra charges for tires being run flat is to insist that drivers make frequent inspections of tires while enroute. We have no records of delays caused by tire trouble.

The majority of our coaches carry two spares. The general trend of tire costs since the beginning of our operation has gradually been downward.

H. P. McDONALD,  
Superintendent of Automotive Equipment,  
Missouri Pacific Transportation Company.

### Tire Expense Decreasing

We have found it advantageous to contract for our tires on a mileage basis because we have felt that it is a cheaper and more simple means of handling a troublesome detail of motor coach operation. In cases where we have abused tires, we are able, through our records, to trace back the coach and the time it was taken off, and thus we are able to hold the operator to account. About 3½ per cent of our total cost of operation may be attributed to tires and tubes, and this expense has been decreasing.

We have no record of the mileage run between roadside delays caused by tire trouble, but we do not feel that it is more than average. We have not felt it necessary for our coaches to carry more than one spare except when they are to be away from our storage or repair points for several days.

H. C. AHERN,  
Manager, Motor Coach Service,  
Boston & Maine Transportation Company.

### Only One Case of Abuse

We do not buy our tires outright, but use them under a contract with the manufacturer, paying for them on a

mileage basis. We do this because we then know definitely what our tires are costing us, and are relieved from the responsibility of maintaining tire equipment except for actually mounting the wheels on the coaches. We also figure it is cheaper to do it this way than to buy tires outright.

With respect to extra charges due to drivers running tires flat: Perhaps we have been fortunate, but this situation has only arisen once in nearly two years, and in the one instance the driver was so clearly at fault that we paid the bill without any question. Due to supervision and the co-operation of our drivers, we have had no trouble in this respect. Our coaches carry but one spare tire. The tire expense has remained practically constant for the past two years.

M. F. STEINBERGER,  
Manager of Highway Transportation, Baltimore & Ohio.

### Manufacturer's Price Reflects User's Care

The tire contract is in vogue with the New England Transportation Co., and it has very evidently been acceptable to operators of fleets as it usually includes the furnishing, delivery and mounting of tires, together with service incidental to removals and repairs.

If tires are abused, whether due to being run flat, under-inflated or to other causes, adjustment is made usually on the basis of the odometer mileage, deducting this reading from whatever the contract concludes to be the predetermined mileage necessary to insure the manufacturer of a fair price for his product. Abuses are thus brought to the attention of the operating department, which is responsible for following up the matter to the end that such abuse be minimized as far as humanly possible.

We average approximately 15,000 miles between roadside delays caused by tire trouble. Coaches in long distance service, such as between New York and Boston, carry two spare tires mounted on wheels. Other equipment is provided with one spare mounted on a wheel.

Price levels are not constant and the price of the manufacturer is bound to include, either in its increases or decreases, the effect of the service and attention which is given to the tires by the contracting companies, to the end that the maximum built-in life of the tire may be utilized. To this end, every operating company should devote their assistance, as otherwise they must experience a rise in cost which will be very similar to the way insurance cost is reflected in the premiums required.

H. M. WALKER,  
General Superintendent,  
New England Transportation Company.

\* \* \*



Providence, R. I.—Worcester, Mass., Motor Coach of the New England at the New Haven's Uxbridge, Mass., Station



# Motor NEWS Transport

## Challenge Tennessee Tax on Interstate Operators

*Validity of levy questioned in  
case of line doing no  
intrastate business*

Taxes levied by Tennessee on motor coach lines conducting an interstate business through that state are challenged in the case entitled *Interstate Transit, Inc., v. Lindsey* which has recently reached the Supreme Court of the United States on appeal from a decision of the Tennessee Supreme Court. This latter upheld the validity of the tax.

The motor coach company, according to an account of the case published in a recent issue of the *United States Daily*, is doing a purely interstate business and the proceeds of the tax belong exclusively to the general funds of the State, according to the filed statement.

The basis of the Tennessee levy is carrying capacity and in the case of each motor coach carrying over 20 passengers, and less than 30 passengers, amounts to \$500 per annum. The appellant in this case operates eight coaches, each having a carrying capacity of 29 people, it was explained.

The Supreme Court of the United States has held, the motor coach company contends, "that a license fee imposed on an interstate carrier by bus can not be sustained as a police measure if it is not imposed as an inspection scheme, and it does not appear that the proceeds are applied to defraying the expenses of such regulation, and that the amount collected is no more than is reasonably required for the purposes."

The proceeds of the Tennessee tax are not used in the construction and maintenance of highways, but go into the general funds of the State, the appellant points out. The decision of the Tennessee Supreme Court that this was immaterial and involves hardly more than a question of bookkeeping destroys the distinction between the taxing and police powers of the State, the taxpaying company contends.

"If a person, firm or corporation engaged in an interstate business in Tennessee, which is a proper subject for police regulation, can be brought within the purview of a taxing statute by referring the question to a 'matter of bookkeeping,' then interstate commerce in Tennessee can be destroyed," the jurisdictional statement says.

## Reading Terminal Opening Planned About October 1

The opening of the new motor coach terminal of the Reading Transportation Company at Philadelphia is planned for about October 1. The new facilities now practically completed are located on the first floor of the present passenger station of the Reading. This first floor has been completely remodeled with changes embodying all features of a modern motor coach terminal including a waiting room and other facilities for passengers as well as for the dispatching of motor coaches under cover.

## Rail-Highway Tickets for P. R. R. Excursions

*Sunday travelers to eastern  
cities may now take sight-  
seeing motor trips*

Combination rail and motor coach tickets for Sunday excursions are now being sold by the Pennsylvania to excursionists traveling over its lines to New York, Philadelphia, Washington and Baltimore, according to a recent item in the "Pennsylvania News," published by the P. R. R.

Under the arrangement, the item points out, excursionists are privileged to take sightseeing motor coach trips in any of the cities visited at extremely low rates.

The arrangement is further described as a new feature which was inaugurated to afford patrons a more enjoyable trip, as many excursionists start out on trips without any definite plan. Tickets for the tours are sold on the excursion train.

Two tours have been arranged for each city. In New York one tour covers points in uptown New York; the other covers downtown New York. In Philadelphia one tour comprises historic Philadelphia, while the other takes in Valley Forge. In Washington the two tours comprise Washington and Arlington and a visit to the public buildings. In Baltimore one tour takes in the historic part of Baltimore, while the other takes in the residential and park sections of the city.

## Southern Lines Expand Inter-Line Tariff Plan

*Now have two bureaus to  
formulate joint ticketing  
arrangements*

Motor coach lines operating in the Southwest are co-operating with those of the Southeast in the formulation of joint tariffs to facilitate ticketing arrangements and interchanges of passenger traffic. As announced in the *Motor Transport Section* of August 23, page 424, the Southern Tariff Bureau was formed following a meeting at Atlanta, Ga., on August 6; this Atlanta meeting was attended by representatives of 27 motor coach lines operating in the South. At the next meeting, held September 2 at Memphis, Tenn., it was decided to change the name of the Southern Tariff Bureau to Southeastern Tariff Bureau and to organize also the Southwestern Tariff Bureau for lines operating in Southern territory west of the Mississippi river.

The Memphis meeting which was attended by representatives of 39 motor carriers was originally called for the purpose of inviting operators west of the Mississippi river to participate in the joint tariff being formulated by the Southern Tariff Bureau (now Southeastern Tariff Bureau)—the original intention to include only those lines operating in the territory south of the Ohio and east of the Mississippi rivers having been altered. After discussion it was decided to continue these same geographic limits in connection with the proposed Southeastern tariff and to formulate a Southwestern tariff for lines west of the Mississippi. This division of territory was decided upon because of the difficulties in a substantial increase in headline points which would make the tariff cumbersome and bulky for an agent to handle. It was also pointed out that if the process of inviting more and more participators were continued the result might be a national tariff rather than the sectional one desired.

In accordance with the foregoing decision of the Southland Greyhound Lines, an affiliate of the Southern Pacific, will withdraw from the Southeastern and participate in the new Southwestern Tariff Bureau. The Southwestern Transportation Company and the Missouri Pacific Transportation Company, high-

*(Continued on page 680)*

## Hotel Coach Exemptions Sustained in California

*Court rules that legislature  
may classify operators for  
certificate requirements*

The California Supreme court in a recent decision upheld that section of the California Auto Stage and Truck Transportation Act which exempts hotel and sightseeing motor coaches from procuring certificates of public convenience and necessity for operation in that state. The case, entitled Sequoia National Park Stages Company v Sequoia & General Grant National Parks Company, reached the supreme court upon appeal from a judgment of the supreme court of Tulsa county, which latter had held the provision of the law to be illegally discriminatory.

The opinion of the Supreme court opens with a description of the routes over which the contesting parties operate. The Sequoia National Park Stages Company operates as a common carrier for the transportation of persons and property over several routes, one of which is that between the city of Visalia and a point near the boundary line of Sequoia National Park. The Sequoia & General Grant National Parks Company operates the Giant Forest Lodge Hotel in Sequoia National Park and in addition a sightseeing motor coach service in that reservation. In order to serve patrons of its facilities in the park it had been operating a motor coach for the transportation of them from the city of Visalia, the nearest railroad connection, to Giant Forest Lodge Hotel by way of Exeter. The plaintiff contended that this train-connection service constituted an operation which required a certificate of public convenience and necessity.

The decision next quotes that part of the Auto Stages and Truck Transportation Act which defines the term "transportation company" and specifically exempts hotel and sightseeing motor coaches from this classification. In this latter connection, the court held "The reasonableness of such classifications must of necessity rest with the Legislature, and its decision in the premises will not be declared invalid unless it appears to be palpably arbitrary. (People v. Monterey Fish Products, 195 Cal. 548.) Every presumption is in favor of the legislative act and the legislative classification will not be disturbed unless it is palpably arbitrary in its nature and neither founded upon nor supported by reason. (In re Sutter-Butte By-Pass Assessment No. 6, 191 Cal. 650). We find no substantial grounds upon which the exemption provision may be declared palpably arbitrary and, therefore, invalid. Many States of the Union have adopted a similar provision. \* \* \*

"It has frequently been observed by courts that all private business partakes of the aspect of a public enterprise, but that circumstance alone does not con-

vert a private business into a public business. Frost v. Railroad Commission, 46 Sup. Ct. Rep. 605, considers at length the power of the State to compel a private carrier to assume against his will the duties and burdens of a common carrier and holds that the State does not possess such powers. If the defendant should be required to conform to the burden of a common carrier in order to serve its private business enterprise by meeting trains to transport its patrons to its place of business, its livelihood would, to say the least, be seriously impaired. Doubtless it is for this reason that hotel and sightseeing busses were exempted by the provisions of the statutes of 1927."

## Alton Is Ordered to Improve Service on Missouri Routes

The Alton Transportation Company, motor coach operating subsidiary of the Chicago & Alton, was ordered by the Missouri Public Service Commission, on September 5, to furnish adequate service on two of the Alton motor coach routes in Missouri, one between Mexico and Louisiana and the other between Mexico and Jefferson City. The commission threatens to revoke the operating certificates covering these routes, which are held by the Alton, if the service is not improved within 60 days.

## Omaha-Kansas City Certificates Granted to the Missouri Pacific

The Missouri Pacific has been authorized by the Railway Commission of Nebraska to substitute motor coach service for two of its passenger trains between Omaha and Kansas City. Testimony in the case indicated that the trains were being operated at a loss of \$9,500 a month.

The commission found that the territory was oversupplied with passenger transportation facilities, and declared that where the people will not make such use of steam trains as will be profitable to the carriers it will not compel the latter to maintain them so long as mail and express service is not materially impaired.

## Pickwick Greyhound Business Increasing in Recent Weeks

Traffic of the Pickwick Greyhound Lines during August increased more than 15 per cent over July figures as the annual winter tourist travel to Southern California commenced, according to Charles F. Wren, president of the company.

"Westbound travel over our lines has been gaining in volume for several weeks," Mr. Wren said, "while a smaller increase has been noted in eastbound travel. In several instances double schedules were operated out of various divisions to care for the overflow. New equipment and the lowest rates in history are prime factors in this growing travel volume. Extra equipment is being held in reserve to meet the heavier travel demands of the coming months when the tourist influx will reach the peak."

## Believes Private Autos Brought Traffic Losses Wisconsin board finds motor coaches are not serious railway competitors

The increasing use of the private automobile rather than the development of motor coach transportation has been responsible for the loss of passenger traffic by railways and other transportation companies, according to the opinion of the Railroad Commission of Wisconsin, as expressed in a recent decision permitting the Metropolitan Motor Coach Company of Chicago to discontinue its highway service between Kenosha, Bristol and Lake Geneva, Wis.

Evidence in the case indicated that during the last six months of 1928 the Metropolitan Motor Coach Company on the route in question sustained a deficit of \$18,566, while for the full year of 1929 its operating loss was \$18,010.

"It was contended," the Commission said, "that the operation of the motor coach line has resulted in the cancellation of practically all railroad service on the Chicago & North Western Railway west from Kenosha, and that as a result of the proposed abandonment the communities west of Kenosha would be without adequate transportation facilities. This would unquestionably, it is stated, affect both the business and social welfare of the City of Kenosha, as well as of the county.

"It is true that the proposed abandonment will leave that portion of Kenosha County served by the line without adequate transportation facilities, but the Commission can not agree that the abandonment of railroad service was brought about by the establishment of the motor-bus routes. The falling off in short-line passenger traffic of the railroads is general throughout the country, whether or not there is motor-bus competition. The cause of the loss of passenger traffic of transportation companies, either steam carrier or motor bus, is, the Commission believes, primarily due to the privately owned automobile, and creates a condition which presents a very serious problem for territories such as the one now served by the applicant.

"The Commission can not, of course, compel a motor-bus company to continue to operate at a loss. It has made an effort to work out with the applicant herein some method which would at least allow the school bus to operate, at a figure which would pay bare operating expenses, with no idea of return on investment, but it is convinced that the establishment of service at rates which would pay expenses would be prohibitive of riding. No method has been suggested, either by the opposition or by the applicant (which we believe has exhausted every reasonable means to make the line remunerative) which gives promise of making the operation a successful one. The Commission, therefore, has no choice but to grant the petition of the applicant."



## Motor Transport Course Established at U. of S. C.

*All phases of motor coach and truck operation included in outline of studies*

A course in motor transportation, involving a study of all phases of motor coach and motor truck line operation in California, has been established by the University of Southern California. The course is under the direction of Ford K. Edwards, instructor in transportation at the university, and sessions, which commenced September 16, are being held in the Transportation building, Seventh and Los Angeles Streets, Los Angeles, each Tuesday evening from 7 to 9:20 p.m.

Following is an outline of the material to be presented in the course:

### Introduction

- (a)—Meaning of Transportation and Its Importance to the Economic, Social and Political Life of the State.
- (b)—Brief History of the Agencies of Transportation in the United States.
- (c)—Growth and Development of Motor Stage and Truck Lines in California.
- (d)—Present Trends in Motor Transportation.
- (e)—State Organizations.

### The Traffic Department

- (a)—Functions.
- (b)—Personnel.
- (c)—Traffic Analysis.
- (d)—Investigations in New Territory.
- (e)—Planning of Service.
- (f)—Handling Claims and Complaints.
- (g)—Public Relations.
- (h)—Tariffs and Time Schedule Distribution.
- (i)—Traffic Development through Solicitation and Advertising.

### The Operating Department

- (a)—Functions.
- (b)—Personnel.
- (c)—Organization.
- (d)—Determination of Schedules, Running Time, Operators' Runs.
- (e)—Dispatching Methods.
- (f)—Operators' Training Schools.
- (g)—Passenger Loading.
- (h)—Freight Pickup, Classifications and Delivery by Parcel Lines, Drayage Companies and Inter-City Truck Lines.
- (i)—Union Freight Terminal Service.

### The Maintenance Department

- (a)—Functions.
- (b)—Personnel.
- (c)—Shop Organization.
- (d)—System of Repair and Overhaul.
- (e)—Car Operation Records.
- (f)—Fuel and Oil Consumption Records.
- (g)—Practical Use of Shop Records.

### TI Accounting Department

- (a)—Functions.
- (b)—Personnel.
- (c)—Structure.
  - General Auditor.
  - Auditor of Disbursements.
  - Auditor of Capital Accounts.
  - Auditor of Cost Accounts.
  - Auditor of Revenues.
- (d)—California State Railroad Commission Uniform Classification of Accounts.
- (e)—Interline Accounting.
- (f)—Practical Use of Accounting Reports.

### Rates

- (a)—Bases for Rate Making:
  - Cost of Providing the Service.
  - Value of the Service to the Consumer.
  - Competition.
  - State Regulation.
  - Social Considerations.
- (b)—Application of the Laws of Increasing Returns and Joint Costs.
- (c)—Study of Rates Based on the Distance Principle, Blanket System and Basing Point System. Practical use of these rate systems by local stage and truck lines.
- (d)—Graphic Presentation and Analysis of Rate Structures.
- (e)—Graphic Detection of Rate Inequalities and Discriminations.

- (f)—Passenger Tariff Construction.
- (g)—Freight Classification for Truck Lines.
- (h)—Freight Tariff Construction.
- (i)—Practical Tests as to the Correctness and Fairness of Rates.

### Financial Organization

- (a)—Form of Business Unit:
  - Individual Proprietorships.
  - Partnerships.
  - Limited Partnerships.
  - Corporations.
- (b)—Use of Stocks, Bonds and Notes.
- (c)—Corporate Rights of the Various Classes of Investors.
- (d)—Railroad Commission Supervision of Security Issues.

### Valuation of Motor Properties

- (a)—Physical Appraisals.
- (b)—Establishment of Unit Value.
- (c)—Theories of Valuation.
  - Original Cost.
  - Cost of Reproduction.
  - Market Value.
- (d)—Depreciation Allowances.
- (e)—California State Railroad Commission Rulings on Valuation Elements.

### Regulation

- (a)—Study of the California Public Utilities Act and the Auto Stage and Truck Transportation Act.
- (b)—Organization and Structure of the State Railroad Commission.
- (c)—Status of Interstate Regulation.
- (d)—Supreme Court Decisions Concerning Regulation.

### Rules of Procedure Before the Commission; Preparation of Cases and Exhibits

- (a)—Preliminary Traffic Studies.
- (b)—Financial Organization.
- (c)—Departmental Organization.
- (d)—Determination of Routes, Equipment, Depot Locations, Rates, Etc.
- (e)—Public Offer of Rates and Service before State Railroad Commission.
- (f)—Procedure in Commission Hearings.
- (g)—Commission Authorization.
- (h)—Inauguration of Service.
- (i)—Carrier's Responsibility to Serve.

## Coaches to Supplant Rail Cars on Washington Route of U. P.

The Washington Department of Public Works has authorized the Union Pacific Stages to extend its Walla Walla-Colefax motor coach line to Bolles, Wash., Junction and Dayton. The additional motor coach service will replace rail motor car service of the Oregon-Washington Railroad and Navigation Company.

## Unification of Highway Routes Sought by the Pacific Electric

The Pacific Electric, Southern Pacific subsidiary, has applied to the Railroad Commission of California for authority to consolidate several of its motor coach operations. The proposed consolidation involves the unification of operations on its Hollywoodland-Beverly Hills and its Hollywood-University-Santa Monica-Ocean Park routes.

## Booklet Lists Specification Requirements of New Zealand

The Transport Department of the New Zealand Government has recently issued a booklet containing data on motor vehicle specification requirements of the Ministry of Transport. Included in the booklet are complete regulations regarding the design and construction of motor coaches for service in New Zealand.

The information is said to be of importance to those manufacturers who may be interested in the sale of highway vehicles in New Zealand.

## Motor Carrier Taxation in Virginia Readjusted

*New law effective January 1, embodies many changes from present plan*

Recent changes in the Virginia law governing the taxation of motor carriers operating in that state are outlined by H. Lester Hooker of the Virginia Corporation Commission in an article published in a recent issue of the United States Daily. Under the new law, Mr. Hooker explains, public carriers are put in the same class with private operators of motor vehicles as regards the license tax, paying the same rates, respectively, per 100 lb. weight in the case of passenger vehicles and on tonnage capacity in the case of property carrying vehicles as do the operators of privately owned passenger automobiles and motor trucks.

Passenger carriers who are holders of Class A certificates under the old law are required to pay a license tax based upon the weight and seat mileage of each vehicle operated; the tax liability is computed on a seat mile basis and the rate varies with the weight of the vehicle.

Vehicles weighing less than 3,000 pounds pay one-fiftieth of one cent per seat mile; vehicles weighing over 3,000 pounds and less than 8,500 pounds pay one-fortieth of one cent per seat mile, and vehicles weighing over 8,500 pounds pay one-thirty-fifth of one cent per seat mile.

The new law provides for a license tax upon the vehicles of class A certificate holders at the rate of 70 cents per 100 pounds weight, plus a road tax, measured by gross receipts from Virginia business, at the rate of 1½ per cent.

Cities and towns through which the vehicles of certificate A holders operate are permitted to tax such carriers, but are limited to a rate of one-fiftieth of one cent per seat mile, computed on the number of miles the motor carrier operates within such city or town.

Two classes of property carriers, under the old law, fall within the jurisdiction of the Corporation Commission in its power to regulate and grant certificates of convenience and necessity. The first of these, now known as certificate D holders, embraces carriers engaged in the transportation of property over fixed routes over the public highways of the State between fixed termini on regular schedule and on published and approved tariff from which it may not depart without first having obtained the approval of the Commission.

Such carriers are now taxed on the basis of carrying capacity and ton mileage at rates varying from one-fifth to three-fifths of one cent per ton mile.

Beginning with the year 1931, carriers of this type will be known as class C certificate holders and will be subject to the following taxes: First, a license tax based upon the rated carrying capacity of trucks or trailers, varying from \$15

for capacity of one ton or less to \$110 for capacity of three and one-half to four tons. For trucks whose capacity exceeds four tons the license tax will be \$110 plus \$40 additional for each one-half ton in excess of four tons.

This license tax is identical with the rates which apply on privately-operated trucks. In addition, class C carriers will be required to pay a road tax to be measured by gross receipts from business done in Virginia at the rate of 1½ per cent.

Cities and towns are privileged to impose taxes against property carriers not to exceed one-fifth of one cent per mile, computed on the number of miles the motor carrier operates over regular routes within such cities or towns.

Where passenger or property carriers engage in interstate operations the new law provides that for purposes of the road tax such part of the total receipts from business done within and without Virginia shall be considered as arising from Virginia operations, as the number of miles traveled by the vehicles of any carrier in Virginia bears to the total number of miles traveled by the vehicles of such carrier within and without Virginia.

Where, however, the tax computed by this method is in excess of the tax which would be due at the rate of one cent per mile for each and every mile traveled by the vehicles of any such carrier over the public highways of the State, the tax computed on the latter basis shall apply.

For both passenger and property carriers the minimum road tax shall be \$50.

### Rural Motor Truck Services Meet Favor in South Africa

Success beyond expectation has been achieved by a new motor truck system conducted by the South African Railways in certain sections of the Orange Free State, according to South African advices received by the Automotive Division, U. S. Department of Commerce. It would now seem that the whole problem of transportation in this region has been solved, and the farmers thoroughly converted to motor transport, the report states.

Until recently weather conditions in the Free State were such as to prevent the movement of corn. However, when the grain had sufficiently dried out there was a general rush to secure speedy transportation, and with the aid of the motor trucks no less than 9,000 bags were transported to the railways within a few days. Requests are now said to be pouring in from all parts of the country for such facilities to be extended into all corners of the province, and it is expected that by next season the entire corn growing area will be served by this method.

Heretofore transport to the railhead has been mostly by ox wagon with its uncertainty and tedious progress. A fleet of five trucks, however, can move 700 bags at one time, which compares very favorably with a branch line train load.

This figure can be improved upon according to some authorities, for it is estimated that over a distance of 13 miles 2,000 bags can be transported in one day, by six trucks and trailers, a load which would require several ox wagons the better part of a week to remove under similar conditions.

Before the end of the present season it is expected that, in the Orange Free State alone, at least 80,000 bags of corn will have been transported to railhead or elevator by these motor trucks.

### Ohio Commission Authorizes Several Highway Operations

The Public Service Commission of Ohio recently disposed of several applications for the operation of highway lines within that state.

The Safety Transit, Inc., was authorized to operate an interstate motor coach line between Covington, Ky., and Parkersburg, W. Va., via Cincinnati, Hillsboro, Chillicothe and Athens, Ohio.

The Mid-Western Motor Transit Co., was authorized to operate an interstate motor coach line between the Pennsylvania-Ohio line and Cleveland, via Akron, Canton and East Liverpool.

The Northern Ohio Transportation Co., of Youngstown, was permitted to extend its motor coach line from Salem to Youngstown.

Another applicant was the Greyhound Lines which has applied for permission to abandon part of its Cincinnati-Pittsburgh route under a particular certificate because it duplicates the service under another certificate. This company also seeks to extend its route from Cincinnati to Covington and from Columbus to Cleveland, thus giving it one interstate

line from Covington to Cleveland and another from Cincinnati to Pittsburgh.

### Motor Transport Committees Planning Convention Program

A joint meeting of the general committee and the regional chairmen of the Motor Transport Division, A.R.A., was held at Chicago, September 15 to 17 inclusive. This meeting was in accordance with the plan announced at the June meeting of the Division in Atlantic City and was held for the purpose of selecting topics for discussion and drawing up a program for the forthcoming sessions to be held next month at Chicago. The tentative dates for this latter are November 18 to 20 inclusive.

The response of the general committee members and the regional chairmen to their meeting indicated an enthusiastic attendance and an interesting program for the November meeting. All but two members of the general committee attended and these two, absent on account of illness, sent representatives. Five out of the seven regional chairmen of the Motor Coach section were present and six out of the seven regional chairmen of the Motor Truck section attended; the Rail Motor Car section was represented by three out of six chairmen, there being one regional chairmanship vacant in this section.

### New Pacific Greyhound Garage at Eureka, Cal., now Completed

The Pacific Greyhound Lines recently completed the construction of a new garage in Eureka, Cal., and are now operating from it. The new garage is situated close to the motor coach terminal in Eureka, and operation from it will involve substantially less dead mileage than was involved in operations from the old garage.

The company is remodeling a building at 712 South Lawrence street and 713 Decatur street in Los Angeles, Cal., to provide what is said will be one of the most modern motor coach service and maintenance plants on the Pacific Coast. The cost of the work under way will be more than \$50,000, and of this amount \$13,000 will be spent for the purchase of new tools, machines and equipment.

Motor coaches will enter the building at one side, proceed past the gassing and oiling pumps, over the grease pits, through the wash racks and past the various inspection stations, and will emerge at the opposite side of the building ready for service.

### Highway Transport Insurance Held to Cover Lost Articles

Assistant Attorney General E. W. Anderson of Washington, in a recent opinion, held that the endorsement required by that state's Department of Public Works in connection with liability and property damage insurance policies filed by motor transportation companies, whereby the insurance company agrees to pay any final judgment for damage to

### N. A. M. B. O. Distributes Operating Practice Report

The National Association of Motor Bus Operators has distributed the preliminary report on its Committee on Operating Practice and Costs. This tentative report entitled "Rules and Regulations Governing Operating and Terminal Employees" was sent to members with the suggestion that they familiarize themselves with its contents and thus become prepared to discuss it at the annual meeting of the organization held this week at Chicago.

The introduction describes the report as a "rule and instruction book" intended to meet the requirements of various motor coach companies engaged in interstate as well as intrastate transportation service. Individual companies considering its adoption would have to make some modifications to meet local conditions. It is thought, however, that on the whole, most of the rules and instructions will apply irrespective of locality."



property, other than the assured's, makes the insurer liable for property being transported for others which is physically destroyed, impaired or lost through negligence in the course of such transportation.

Mr. Anderson ruled that the term "damage," as used in the Transportation Act is broad enough to include indemnity for lost articles as well as for physical impairment. There is no distinction between a total loss to a shipper through complete destruction of property, he stated, and such a loss to the shipper through the property being lost, strayed or stolen while in possession of the transportation company. The opinion, was given to the state insurance commissioner.

### "Cape to Cairo" Motor Route Now Reported in Operation

What is described as the world's longest motor taxi route has recently been inaugurated in Africa, states a report to the Automotive Division, U. S. Department of Commerce, from Assistant Trade Commissioner DuWayne G. Clark, Johannesburg, South Africa. This service, which is known as Trans-African Motor Safari, has been started to carry tourists from the Juba, terminus of the Nile steamers, to Cape Town. The entire trip is scheduled to take approximately eight weeks, including stops at principal cities.

Several independent trips have been made during the past few months, and now the realization of the new taxi service would seem to indicate that the hazardous parts of the journey have been eliminated. However, the first southern trip of the new taxi was, according to reports, not without its element of chance and circumstances. At one place it is said that, due to the rains, the car required 23 days to negotiate a piece of road which, under ordinary conditions would have taken two days. In one section five days were spent doing 300 yards.

The heavy rains which occur in the northern and middle sections of the continent are the most serious disadvantage to road motor transportation. Roads which, during the dry season, are quite good, become swampy and impassable with the first rain.

While the new service has been announced as permanent the report states that there is some question whether it can be operated regularly, until conditions are improved to a marked degree.

### Pennsylvania General Transit Gets Three Ohio Certificates

The Pennsylvania General Transit Company, highway subsidiary of the Pennsylvania, recently received three certificates for the operation of interstate motor coach routes from the Public Service Commission of Ohio.

Two of the routes involved are between Pittsburgh, Pa., and Ft. Wayne, Ind., and the other is between Pittsburgh and Covington, Ky., all three passing through Ohio.

The latter line will be by way of Steubenville, Cadiz, Cambridge, Lancaster,

### Pickwick Greyhound Lines Announce New Low Fares

The Pickwick Greyhound Lines and the Pacific Greyhound Lines, on August 26, announced a cut in motor coach fares of 10 per cent, thus making their second recent reduction in long distance rates. The new rates apply only to eastbound travel and are effective from California to all points east.

J. D. Watson, traffic manager, describes this latest slash in tariffs as "a new all-time low mark for motor coach travel, bringing the rates to Denver down to \$22.25, Kansas City \$28.35, Chicago \$34.85 and New York \$49.50, with corresponding low rates to intermediate points. Travel over our lines increased materially as a result of the excursion tariffs placed in effect August 10, and we anticipate a further increase from the new low rates. New coaches recently placed in service on Pickwick Greyhound and affiliated lines and improved terminal facilities also are factors in the growing travel volume."

Circleville, Washington Court House and Cincinnati. The first of the two routes between Pittsburgh and Ft. Wayne passes through East Palestine, Columbiana, Damascus, Sebring, Alliance, Canton, Massillon, Wooster, Mansfield, Gallion, Lima and Delphos.

The second route passes through East Liverpool and Lisbon and joins the others from Canton westward.

### Motor Transport Conferences Sponsored by U. S. Chamber

Consideration and study of the problems of automobile and airplane transportation from both a local and national standpoint, and the orderly and systematic development and control of these facilities, will be given this fall in a series of eight regional conferences held under the auspices of the Chamber of Commerce of the United States.

The Aeronautical Chamber of Commerce of America will cooperate in all of the conferences in the consideration of aviation questions and features, while officials and members of the National Conference on Street and Highway Safety will give assistance in the discussion of matters relating to vehicle legislation and regulation, and other factors having to do with safety and accident prevention, and the development of facilities for traffic on the streets and public highways.

The first of the conferences will be held in Philadelphia on September 23 and 24, and the second one at Boston on September 25 and 26. Conferences have also been scheduled for Chicago on November 5 and 6. There will also be conferences in November for the southwestern states at Atlanta, and for the

southwestern states at Dallas. Two other conferences for the Rocky Mountain and Pacific coast states will be held in December.

The outstanding aspects of motor vehicle traffic conditions that will be considered are:

1. Adoption by states and cities of uniform laws and ordinances for the control and regulation of street and highway traffic.
2. Safety and accident prevention in the operation of motor vehicles and the movement of traffic.
3. Immediate and permanent measures or the relief of traffic congestion and facilitating the movement of vehicles.
4. Safeguards and safety measures at street and highway intersections and railway grade crossings.
5. Promotion of traffic safety and effective control through cooperation of business organizations and citizens' traffic committee, and the intelligent zoning and planning of towns and cities and locating arterial streets and highways.
6. Effective safety education, especially among pedestrians and children, and means for their protection in traffic danger zones.

### Missouri Pacific Operations Now Cover 4,059 Route Miles

The "Index to Motor Coach lines" published in the latest issue of the Missouri Pacific Transportation Company time table, dated July 22, lists 36 motor coach routes involving operations over 4,059 route miles. This represents an increase of more than 500 route miles, since the first of the year—the timetable dated January 15 also listed 36 routes but operations on them then extended over only 3,510 route miles.

The longest of the routes listed is the 283-mile run between St. Louis and Kansas City, Mo., as was the case in the index to the January 15 time table. Many routes have been extended since that time, however, and others adjusted, the additional mileage on the same number of routes being accounted for in this way. If it were listed as one route the recently established through route between St. Louis and Palestine, Tex., (see *Motor Transport Section* of July 26, page 217) would be over 700 miles; it is listed as four lines as follows: St. Louis to Poplar Bluffs, Mo., 169 miles; Poplar Bluffs to Little Rock, Ark., 228 miles; Little Rock to Texarkana, Ark., 171 miles; Texarkana to Palestine, 184 miles.

The time table includes a double page map of the Missouri Pacific motor coach lines. This reveals that operations extend from Omaha southeast to St. Louis and thence southward to Palestine, Tex., and Natchez, La. Branch lines reach out all along this general route while there are detached operations between Brownsville and Corpus Christi, Tex.; between Houston and Freeport and West Columbia, Tex.; between New Orleans and Buras, La., and between Joplin and Hollister, Mo.

The advertising in the folder lists the resorts served by Missouri Pacific motor coaches and calls attention to the fact

that "Special parties, desiring to visit the playground or other points of interest along the lines, may charter motor coaches for the whole trip by highway or through connections with Missouri Pacific trains."

Shippers of small packages are urged in another advertisement to ship these by motor coach. "Small express packages weighing less than 100 pounds," this announcement says "may be shipped via motor coach safely and conveniently. C.O.D. packages will be accepted and money returned without delay. Careful handling, personal attention and moderate rates make it an ideal way to ship express bundles."

The back cover of the folder suggests that joint rail-highway service is "cheaper than all-rail—faster than all-highway" and includes a map of the motor coach connections of the Missouri Pacific Transportation Company; these motor coach lines from the east interchange traffic with the Missouri Pacific Transportation Company at St. Louis and Little Rock.

### Interstate Coaches and Stations Now Bear Names of Railways

The Chicago & North Western and the Union Pacific, which jointly own the Interstate Transit Lines operating motor coaches between Chicago, Omaha, Neb., and the Pacific coast, have adopted a new plan to more closely identify the motor coach company with the railway company. The name Interstate Transit Lines has been removed from the motor coaches and from the motor coach stations. In North Western territory, the equipment and facilities are being operated under the name "Chicago & North Western Stages," while in Union Pacific territory, the name "Union Pacific Stages" has been applied.

The corporate name of the motor coach operating company remains Interstate Transit Lines, and the management and methods of operations likewise remain the same.

### Use of Compressed Air Horns Banned by N. J. Commissioner

Because compressed air horns on motor coaches have become a nuisance and a menace to safety, the New Jersey commissioner of motor vehicles, Harold G. Hoffman, has recently issued an order prohibiting the use of these devices.

"A large number of buses operating upon the highways of the State," said Commissioner Hoffman as quoted in a recent issue of the United States Daily, "are equipped with a compressed air horn to blow two or three trumpets. These horns are extremely loud, giving a volume of sound that is comparable to that of a locomotive whistle. They make far more noise than is necessary as a warning signal."

"In villages, towns and other built-up sections, or even in the open country, these blasts are harmful to sick people, and enough to startle the nerves of even normal persons, and they have become a great nuisance from this standpoint."

"The use of these horns is typical of the get-out-of-the-way attitude of high-powered buses, whose operators seem to delight in frightening other users of the highways, and in trying to convey the impression that the big bus is the 'monarch of the road.' When these horns are blown in the rear of a car, the effect is so startling as to frighten a person to the extent of forcing a car off the road; there have been several accidents caused in this manner."

"There is no reason why the bus should have a louder warning signal than any other motor vehicle on the highway. Sirens are forbidden for private cars, and these horns are far worse than a siren. From the standpoint of safety and the abatement of a serious nuisance, it becomes necessary to prohibit their use on the highways of New Jersey."

### Additional Highway Services Bring Savings to Cotton Belt

With the elimination of rail motor cars No. 9 and 10, operating on daily schedules between Illmo, Mo., and Malden, the St. Louis Southwestern, by substituting motor coach service, has made an additional saving of 128.8 train miles per day. As a result of this program of replacing local train service with motor coach service, the Cotton Belt, during the month of July, reached a total of 14,260 passenger train miles saved. Motor coaches operated by the Southwestern Transportation Company, motor transport subsidiary of the Cotton Belt, made possible this saving of train miles by the railway through the operation of 275,827 motor coach miles. During the same month, the transportation company's motor trucks handling mail, baggage, express and freight, operated a total of 100,847 truck miles. In addition, there were 18,953 trailer miles operated in freight service. Also during July, trap cars were hauled 76,339 miles by the Cotton Belt, carrying merchandise between pick-up and delivery stations operated by the Southwestern Transportation Company.

### Southern Lines Expand Inter-Line Tariff Plan

(Continued from page 675)

way subsidiaries respectively of the St. Louis Southwestern and the Missouri Pacific are other railway operators who plan to participate in the proposed Southwestern joint tariff. P. J. Neff, vice-president and general manager of the Missouri Pacific Transportation Company, has been elected temporary chairman of the Southwestern Tariff Bureau.

It was further decided at the Memphis meeting that the Southeastern and the Southwestern tariffs should each have 100 headline points and 2,000 sideline points. The announcement following the meeting said in closing. It is clear to see the advantages to be obtained by the motor coach industry in the issuance

of these two tariffs. The Southeastern tariff is in the state of compilation and the Southwestern tariff will be compiled as soon as details are worked out."

### Orders for Equipment

THE PICKWICK GREYHOUND LINES, Kansas City, Mo., has accepted delivery of ten Mack, Model BK, 265" motor coach chassis.

### Among the Manufacturers

Robert C. Lee of the guardian Trust Company, Cleveland, Ohio, has been elected a director of the Ohmer Fare Register Company, Dayton, Ohio.

The Wisconsin Axle Company, Oshkosh, Wis., has commenced work on an addition to its machine shop. The new building will adjoin the present factory and will be approximately 100 ft. x 150 ft.

The Hercules Motors Corporation, Canton, Ohio, has opened a new office in the Chanin building, Forty-second Street and Lexington Avenue, New York City; C. P. Weekes, Hercules sales representative and manager of the eastern territory, will make his headquarters at this office.

### Motor Transport Officers

Albert E. Clift, president of the Central of Georgia, has been elected president of the Short Lines Motor Transport Company, with headquarters at Savannah, Ga. Mr. Clift succeeds Charles Molony, deceased. B. H. Lord has been appointed general manager of the company.

E. F. Curtis, supervisor and driver instructor for the Pacific Greyhound Lines, with headquarters at Redding, Ore., and having jurisdiction over operations from Medford, Ore., to Davis, has been transferred to Sacramento. Mr. Curtis will continue to supervise the Oregon operations as well as those in the vicinity of Sacramento.

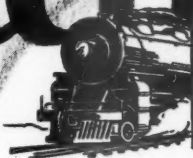
### Trade Publication

THE NATIONAL CARBON COMPANY, INC., New York, makers of Eveready Products, will shortly release a complete automotive cooling system servicing manual. The new manual is intended primarily for the information of servicemen, and will present complete data for the servicing and maintenance of automotive cooling systems and will include a question and answer section concerning anti-freezes. The various necessary steps to efficiently clean cooling systems by pressure flushing, using various cleaning agents, are presented, along with timely hints and the best known methods of maintaining the cooling system at its highest point of efficiency. The new manual may be procured upon request from any of the company's offices.



Two Sections—Section Two

# Railway Age



**Motor Transport Section**

*Devoted to the  
Co-ordination of Railway and Highway Service*



SEPTEMBER 27, 1930



## *In This Issue*

**Truck Competition Is Taking the Railways' Carload Traffic**  
**Putting Equipment Where It Is Needed**  
**Maintaining the B. & O. Train Connection Coaches**  
**Preparations for Winter Weather**

# MODERN CONDITIONS

*accent the need for*

## **BENDIX - WESTINGHOUSE** **Automotive** **AIR BRAKES**

Crowded highways, jumbled city traffic, unprecedented speed of today's super transport vehicles, modern standards of economic transportation . . . All have contributed to the never equaled popularity of the sure, quick, effortless action of the power brake. Never before has the demand for Bendix-Westinghouse Automotive Air Brakes been so pronounced. As evidence of the trend prominent commercial fleet operators everywhere have standardized on Bendix-Westinghouse Brake Control. They have learned the economy of a perfect stopping force and, when purchasing new units, are rigidly specifying Bendix-Westinghouse equipment in those few instances where the system is not standard. The trend is permanent and its growth apparent with the future evolution of the heavy duty vehicle. Today's Bendix-Westinghouse Automotive Air Brake offers a perfect balance for modern speed and power with a wide margin of reserve for tomorrow's development. The remarkable effectiveness of the Bendix-Westinghouse Brake is not an accident but, rather, the result of sixty-one years deliberate research, development and manufacture of power braking equipment . . . the recognized safety standard of the world.



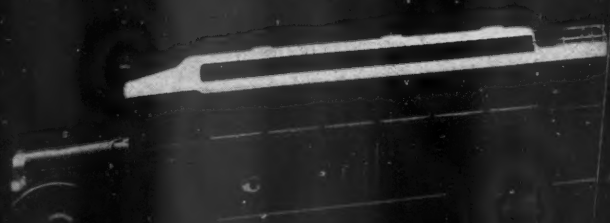
*The heart of the Air Brake, this sturdy compressor easily becomes a part of any power plant. Tucked away under the hood, it furnishes a never-failing air supply for brakes, airhorns and other miscellaneous pneumatic devices.*

**BENDIX - WESTINGHOUSE**  
**Automotive Air Brake Co.**  
**PITTSBURGH — PENNSYLVANIA**



C. M. ST. P. & P. R.R.

C. OF G. R.R.



# PULLMAN SERVICE ON LOCAL LINES

STOPS LOSS ON LOCAL TRAINS

INCREASES LOCAL SERVICE

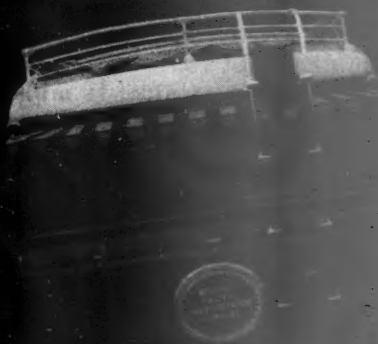
EXPANDS LOCAL TRAFFIC

OUR TRANSPORTATION SURVEY DEPARTMENT HAS ACCUMULATED DATA  
AND INFORMATION FROM OVER 700 ANALYSES OF OPERATING  
PROPERTIES—AND SERVICE IS AVAILABLE TO YOU.

GENERAL MOTORS TRUCK CO., PONTIAC, MICH.



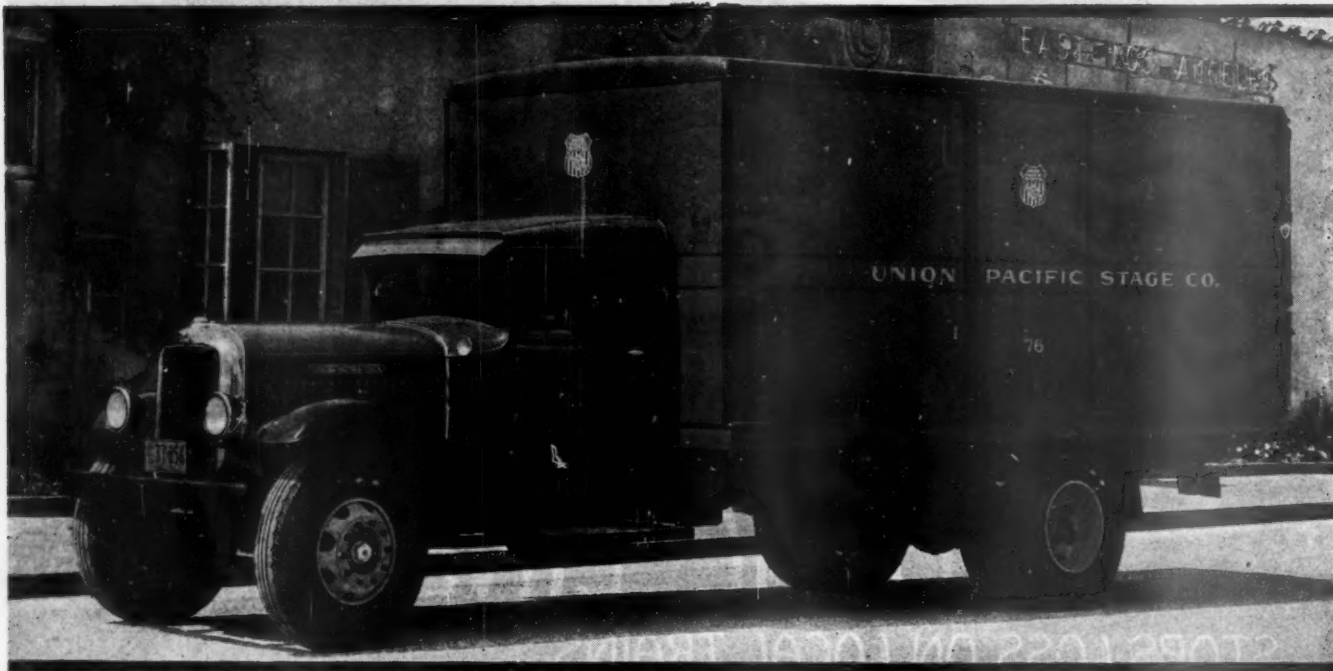
N. Y. N. H. & H. R.R.



MO. PAC. R.R.

# BALLOON-TIRED "BAGGAGE CAR"

## OPERATED *by* UNION PACIFIC



**W**ITH unusual speed and real economy this big, rugged truck now handles express and baggage for the Los Angeles & Salt Lake Railroad (Union Pacific) between Los Angeles and San Pedro, California. It was installed when the company replaced trains on the branch line between these cities with buses.

The interior of the body is completely equipped as a standard baggage car.

The chassis is the General Motors Truck, Model T-60. It has steel-muscled huskiness in every part to match the power and day-long speed of the famed 6-cylinder engine. The 9-inch frame has a "stress absorber," at the point of maximum strain. It adds tremendously to frame strength—without useless dead weight.

No truck in this capacity range has ever had a finer rear axle. It is of the full-floating worm drive type with axle shafts of chrome-nickel

steel. The heavy I-beam front axle is drop forged, heat treated.

Road shocks are smoothed out and sidesway eliminated by 35-inch, *auxiliary* springs operating in conjunction with 54-inch, 18-leaved main rear springs. The powerful, 4-wheel brakes are of remarkably simple adjustment. The truck maneuvers almost as easily as a passenger car. Roomy, comfortable and weather-tight, the cab rides easily as a result of its three-point mounting, reducing driver fatigue.

The clutch, ignition system, transmission—and all other performance factors—have proved their durability in long, trouble-free service.

No truck in the range of heavier duty, regardless of price, has more impressive records of work handled at low cost than this model has written on the cost sheets of hundreds of owners.

*Investigate this great performer—today!*

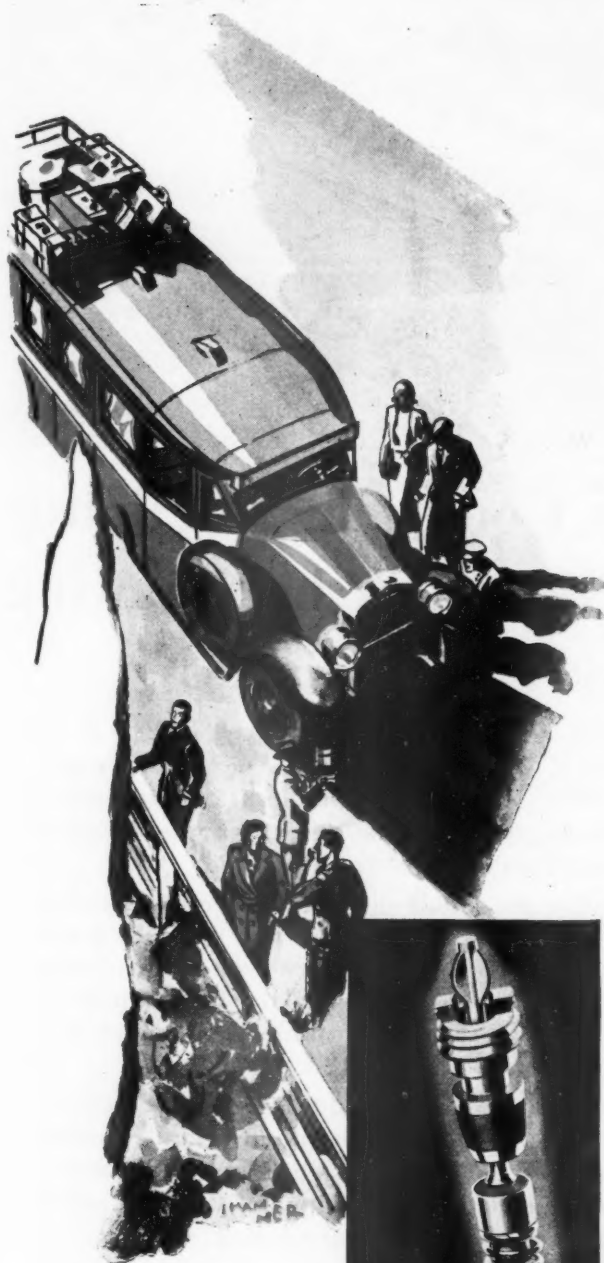
# GENERAL MOTORS TRUCKS

TIME PAYMENTS, on any General Motors Truck, are financed at lowest rates available anywhere, through our own Yellow Manufacturing Acceptance Corp. GENERAL MOTORS TRUCK CO., Pontiac, Michigan (Subsidiary of Yellow Truck & Coach Mfg. Company) GENERAL MOTORS TRUCKS... YELLOW CABS... COACHES. Factory Branches, Distributors, Dealers—in over 2000 principal cities and towns.

PRODUCT OF GENERAL MOTORS



# One Inferior Valve Core may COST VALUABLE TIME



**Y**OU can't have "on time" performance in your bus operation if your vehicles are constantly meeting with road failures due to inefficient tire valve performance.

Avoid such troubles and the loss of good will which schedule delays entail, by using only genuine Schrader Products. Schrader engineers have developed tire valves, cores and caps to meet every demand of modern bus operation. More than 85% of all tubes made in the United States and Canada are factory equipped with genuine Schrader Valves.

There are Schrader Tire Gauges also, especially for busses—playing an important part in better tire performance and greater mileage through the maintenance of correct tire pressures. Schrader Gauges are built on the direct-action principle. The air enters the air chamber and pushes the indicator to the correct pressure reading—no complicated mechanism, sturdy, handy and accurate.

Always insist on genuine Schrader Products—Valves, Valve Cores, Valve Caps and Tire Gauges. If you have any special tire inflation problems connected with bus operation, write us. Schrader engineers will gladly assist you. A. Schrader's Son, Inc., Brooklyn, Chicago, Toronto London.

*Be sure it's a Schrader—Look for the name*

## Schrader

Makers of Pneumatic Valves Since 1844

Tire Valves ▼ Tire Gauges

**and now****IT ROLLS ALONG ON****ALL SIX**

**Another actual case where a Goodrich Distributor  
cut tire costs by knowing  
more about trucks!**



*There is a GOODRICH TRUCK TIRE  
to fit the load—the operating  
conditions of every individual  
truck in your fleet . . . Balloons  
. . . High Pressures . . . Solids*

**Goodrich**  
HEAVY DUTY  
**Silvertowns**

**G**LENN E. BRUCE, President, Bruce Transfer and Rent-A-Truck Co., Des Moines, Iowa, operates a fleet of twenty trucks and ten passenger cars equipped 100% with Goodrich Silvertowns.

Ever since the Goodrich Distributor recommended tandem equipment (4 wheels in rear) for the truck shown above—resulting in more economical operation—Mr. Bruce has requested this Distributor to analyze each truck to determine the proper tire equipment.

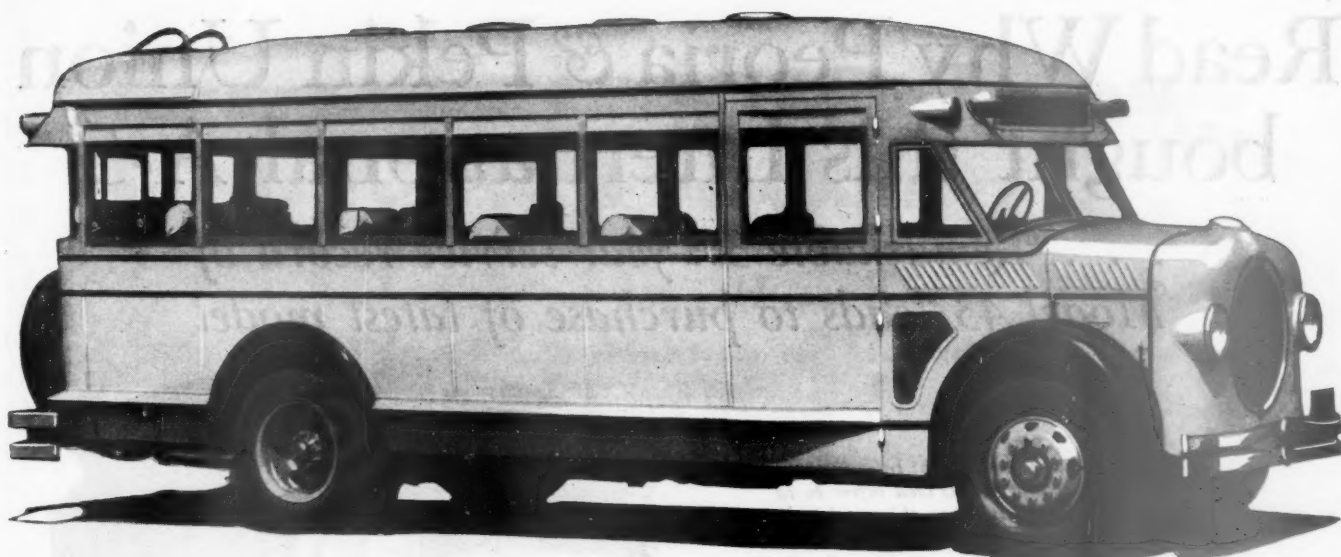
This "Goodrich Specialized Service" is available to all tire users. Goodrich Distributors first consider the conditions under which trucks must operate—then recommend the tire equipment that will prove the most economical and long wearing.

The B. F. Goodrich Rubber Company, Established 1870, Akron, Ohio. Pacific Goodrich Rubber Co., Los Angeles, Calif. In Canada: Canadian Goodrich Co., Kitchener, Ontario.



**SPECIFY GOODRICH ON  
YOUR NEW TRUCKS . . .**





## Chrysler Motors Announces FARGO Motor Coaches

Unique . . . practical . . . a radical and original departure from conventional motor coach design. Perfected after intensive and extensive research, engineering and testing, the new Fargo Parlor Coach meets, in full measure, the needs of railroad operations.

Uniquely designed with a comparatively short wheelbase and ample passenger space this new and original motor coach is surprisingly easy to maneuver.

The Parlor Car seats 21 to 25 passengers and provides the all-around comfort and feeling of safety that riders welcome.

Consider but a few of the many features of this new coach—double-drop frame, full-floating worm drive rear axle, easy accessibility for engine adjustments or repairs, 172-inch wheelbase, 120 H. P. 8-cylinder motor, 4-speed transmission, internal 4-wheel hydraulic brakes—features that insure increasing patronage and lower cost per mile.

*For additional information, write Fargo Motor Corporation, Detroit, Michigan*

**TO BE SOLD DIRECT**

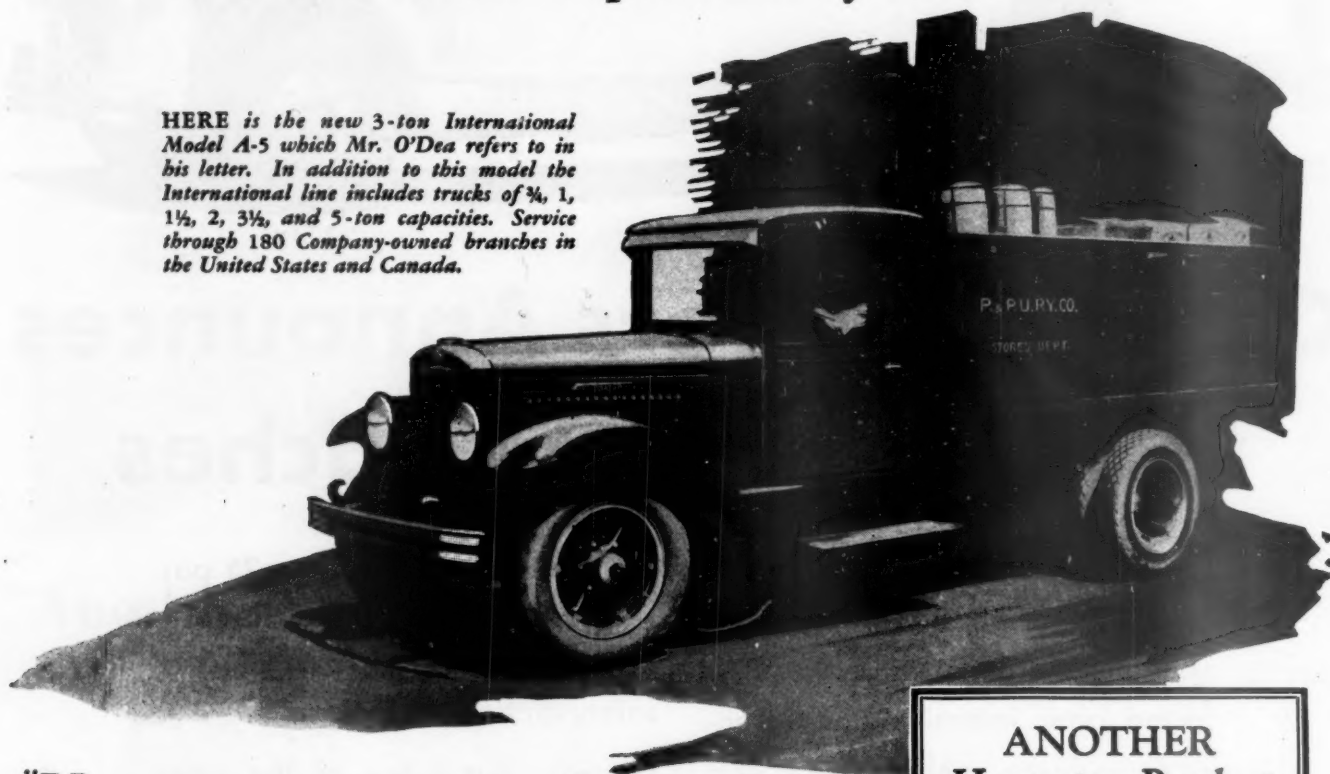
# **FARGO MOTOR CORPORATION**

**A DIVISION OF CHRYSLER CORPORATION**

# Read Why Peoria & Pekin Union bought this International A-5

*. . . Remarkable 3½-year service record of  
Model 43 leads to purchase of latest model*

HERE is the new 3-ton International Model A-5 which Mr. O'Dea refers to in his letter. In addition to this model the International line includes trucks of ¾, 1, 1½, 2, 3½, and 5-ton capacities. Service through 180 Company-owned branches in the United States and Canada.



"You may be interested in knowing," writes Mr. J. T. O'Dea of the Peoria & Pekin Union R. R., "that we have just placed an order with your Peoria Branch for one of your new International Model A-5 Speed Trucks for immediate delivery.

"This truck is to be used in our storehouse service hauling material, locomotive and car parts from point to point within the terminal, and replaces an International Model 43 which we have used constantly in heavy-duty service for 3½ years. During this period we have had occasion to make very few repairs, and the only replacement of any consequence we have had was a set of new tires applied during 1929.

"We want to say that our experience with International Trucks has been extremely favorable and wish to commend most highly the character of the service and repair facilities afforded by your organization."

*Ask the nearest branch for demonstration. Catalog on request.*

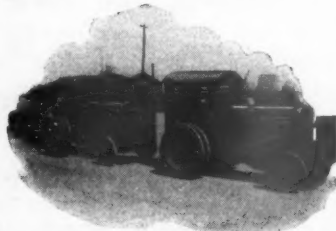
**INTERNATIONAL HARVESTER COMPANY**

606 So. Michigan Ave.

OF AMERICA  
(Incorporated)

Chicago, Illinois

## ANOTHER Harvester Product



### Doing Good Work

The accepted standard of power. Mobile, compact, versatile, and flexible. Quality-built, liberally powered. Delivers power 3 ways—drawbar, belt and power take-off. Adaptable to an amazing variety of installations—combines with an endless list of equipment. Models 20 and 30

**MCCORMICK-DEERING**  
Industrial Tractor

# INTERNATIONAL TRUCKS

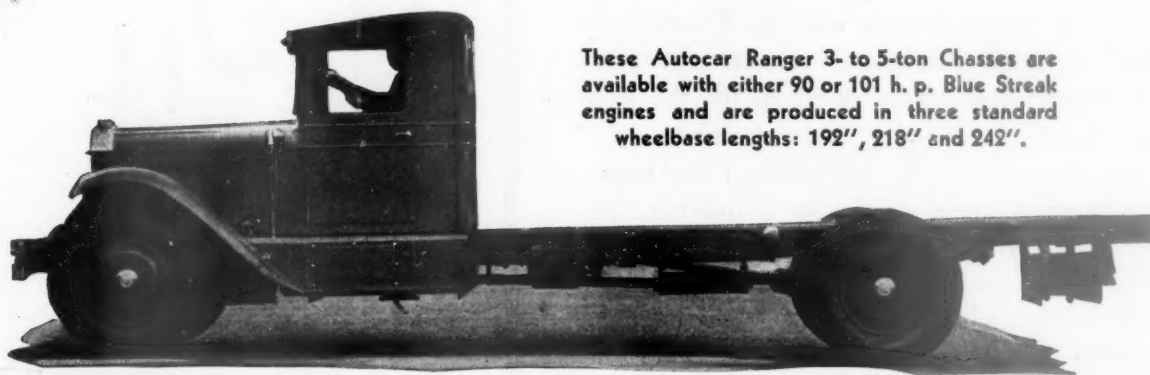


## For L. C. L. Pick-up and Delivery Trucking . . .

**Autocar 3- to 5-ton Rangers Offer Railroads the Ideal Combination of Capacity, Reliability, Economy and Speed Required on L. C. L. Freight Pick-up and Delivery**

These tonnage toters put the miles behind them, carrying full capacity on the free open highways or struggling through choked city traffic, with a new idea of smoothness and coolness . . . economy and on-time reliability. » » »

Powered amply by the Autocar Blue Streak Big Six engine, driving through the improved Autocar double reduction rear axle, equipped with four wheel brakes and booster, with magneto ignition, electric lights and starter, heavy duty schedules mean nothing to these super-sturdy Autocars. Leading haulers are using them on their L. C. L. service with impressive success.



These Autocar Ranger 3- to 5-ton Chasses are available with either 90 or 101 h. p. Blue Streak engines and are produced in three standard wheelbase lengths: 192", 218" and 242".



# AUTOCAR TRUCKS

THE AUTOCAR COMPANY, ARDMORE, PA.



## Why millions of motorists now stop at ETHYL PUMPS

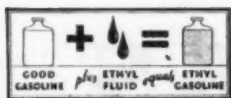
**E**THYL makes such a difference in motor car performance that more than 75 oil refining companies are now mixing and selling Ethyl Gasoline.

"Is there any difference," you may ask, "between the Ethyl Gasoline sold by one company and that sold by others?" The answer is this:

The Ethyl Gasoline Corporation requires that *all* Ethyl Gasoline must contain enough Ethyl anti-knock fluid to meet the Ethyl standard of anti-knock quality. It also sets a standard for the base gasoline used, as regards purity and volatility.

Most oil companies mixing and selling Ethyl Gasoline are exceeding these minimum standards, but you may be sure that *any* pump bearing the Ethyl emblem contains good gasoline of an anti-knock rating sufficiently high to "knock out that 'knock'" in cars of ordinary compression and develop the additional power of the new high-compression cars. Ethyl Gasoline Corporation, Chrysler Building, New York City.

*The active ingredient in Ethyl fluid is lead*



Knocks out that "knock"

Your car will run better with Ethyl. Try Ethyl in your own car. See how much better it performs; how much longer you stay in high; how much faster you get away. You'll find it more enjoyable and economical to drive with Ethyl in your tank.



© E. G. C. 1930

# ETHYL GASOLINE



## BUYERS' INDEX

<b>Air Brakes</b> Westinghouse Air Brake Co.	<b>Plush, Mohair</b> Chase & Co., L. C.
<b>Axles, Motor Truck</b> Timken Detroit Axle Co.	<b>Rattan</b> Heywood-Wakefield Co.
<b>Bodies, Coach</b> Bender Body Co.	<b>Seat Material</b> Heywood-Wakefield Co.
<b>Brake Drums</b> Hunt-Spiller Mfg. Corp.	<b>Seats</b> Heywood-Wakefield Co.
<b>Brakes, Air</b> Westinghouse Air Brake Co.	<b>Tanks, Air, Gas, etc.</b> Westinghouse Air Brake Co.
<b>Brakes, Electric</b> Westinghouse Air Brake Co.	<b>Tires</b> Firestone Tire & Rubber Co.
<b>Cars, Auto, Gas and Electric.</b> Autocar Co., The.	Goodrich Rubber Co., B. F.
<b>Cleaners, Bus &amp; Truck</b> Oakite Products, Inc.	Goodyear Tire & Rubber Co., Inc.
<b>Coaches</b> Fargo Motor Corp.	<b>Tractors</b> International Harvester Co.
<b>Coaches, Motor</b> American Car & Foundry Motors Co. (Fageol Motors Co.)	<b>Trailers</b> Fruehauf Trailer Co.
Dodge Brothers, Inc.	<b>Trailers, Four Wheel</b> Fruehauf Trailer Co.
International Harvester Co.	<b>Trailers, Heavy Duty</b> Fruehauf Trailer Co.
White Co.	<b>Trailers, Pole</b> Fruehauf Trailer Co.
<b>Covering, Seat Rattan</b> (See Rattan)	<b>Trailers, Semi</b> Fruehauf Trailer Co.
<b>Drive, Gas Electric Coaches</b> General Electric Company.	<b>Trailers, Truck</b> Fruehauf Trailer Co.
<b>Engines, Gasoline</b> American Car & Foundry Motors Co. (Fageol Motors Co.)	<b>Trucks, Motor</b> Autocar Co., The.
<b>Fittings, Air Brake</b> Westinghouse Air Brake Co.	Dodge Brothers, Inc.
<b>Forgings, Monel Metal</b> International Nickel Co., The	General Motors Truck Co.
<b>Gages, Tire</b> Schrader's Son, Inc., A.	International Harvester Co.
<b>Gasoline</b> Ethyl Gasoline Corp.	White Co.
<b>Machine Screws, Monel Metal</b> International Nickel Co., The	<b>Tubes, Tire</b> Firestone Tire & Rubber Co.
<b>Monel Metal, Rods, Sheets, Tubes, Wire, etc.</b> International Nickel Co., The	Goodrich Rubber Co., B. F., The.
	Goodyear Tire & Rubber Co., Inc.
	<b>Upholstery, Car</b> Chase & Co., L. C.
	<b>Valve Caps</b> Schrader's Son, Inc., A.
	<b>Valves, Tire</b> Schrader's Son, Inc., A.



## A SPECIALLY DESIGNED CHAIR!

This luxurious chair, specially designed for the Montreal Tramways, is an example of the custom and styled-to-order seats produced by Heywood-Wakefield. The Montreal organization was seeking a bus seat for city service with an unusually low, yet comfortable, back; a seat with wide arm rests which could be placed on close centers; a style that would economize on space, yet retain the luxurious appearance and comfort of de luxe bus chairs. The H-W bus seat illustrated above satisfactorily answered every requirement of the Tramway Company.

Write to the nearest sales office for details of this specially designed chair and our regular line of bus seats.



Send for your copy of our new Bus Seat Catalogue, in which our bus seating is described in detail.

## Bargains in Buses

In an effort to standardize on a few makes we have on hand a number of very desirable buses for quick disposal. These buses include Fageol sixes in excellent mechanical condition and good for many, many more miles of dependable service. Many of these buses have been rebuilt with raised roofs, inside baggage racks and reclining chairs. There are also some A. C. F.s both with and without inside baggage racks. Internationals, Reos, Studebakers, etc. All buses have weathertight bodies and are in first class mechanical condition. Write or wire for specifications and prices. Address P. C. Johnson

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The G. F. Cotter Supply Co., Houston, Texas  
The Railway and Power Engineering Corporation  
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# Accident Insurance



**G**OOD brakes are one of the best known forms of insurance against accidents—an insurance of safety to passengers and pedestrians—an insurance against damaged equipment and expensive litigation.

Many transportation companies are protecting themselves by installing HUNT-SPILLER AIR FURNACE GUN IRON Brake Drums on all automotive equipment.

Their uniform wear resisting qualities insure maximum braking efficiency, positive control in all emergencies and safer operation.

*And a big savings in brake maintenance costs.*

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383 Dorchester Ave. South Boston, 27, Mass.

## Finished Brake Drums of HUNT-SPILLER Air Furnace GUN IRON

### Index To Advertisers

<b>A</b>	
Autocar Company, The.....	81
<b>B</b>	
Bender Body Co., The .....	85
Bendix-Westinghouse Automotive Air Brake Co.	72
Buyers' Index .....	83
<b>E</b>	
Ethyl Gasoline Corp. ....	82
<b>F</b>	
Fargo Motor Corp. ....	79
<b>G</b>	
General Electric Co. ....	76
General Motors Truck Co. ....	73-74
Goodrich Rubber Co., The B. F. ....	78
Greyhound Lines .....	83
<b>H</b>	
Heywood-Wakefield .....	83
Hunt-Spiller Mfg. Corp. ....	84
<b>I</b>	
International Harvester Co. ....	80
<b>O</b>	
Oakite Products, Inc. ....	84
<b>S</b>	
Schrader's Son, Inc. ....	77
<b>T</b>	
Timken-Detroit Axle Co., The .....	86

### Maintains cleaning schedules and saves money!

**C**LEANING schedules are maintained with the same precision as operating schedules in shops where Oakite materials and methods are used. Delays in repair work are avoided.

Whether there are dirt-encrusted chassis parts, or grease covered motor parts to be cleaned before inspection or reassembly . . . or whether there are bodies to be washed, you can depend on Oakite materials to do a given amount of work per day.

And . . . save money, too!

For in addition to doing a thorough, quick cleaning job, Oakite does it economically. And there is **NO FIRE OR EXPLOSION HAZARD** because Oakite is used in a water solution recommended by insurance companies.

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*Oakite Service Men, cleaning specialists, are located in the leading industrial centers of the United States and Canada*

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Industrial Cleaning Materials and Methods



## B·E·N·D·E·R... B·O·D·I·E·S



## *his* BENDER PALACE HYWAY COACH... *Performs a Double Duty*

**H**OW often have you wished for a unit that would meet the requirements of varying traffic conditions.

This intermediate size of the BENDER Palace Hyway Coach, with 25 permanent seats, fills the needs of operators for moderate travel... and with six auxiliary seats, easily accommodates 31 passengers when travel is heavier... A "happy medium" ideally suited to the conditions of hundreds of operators.

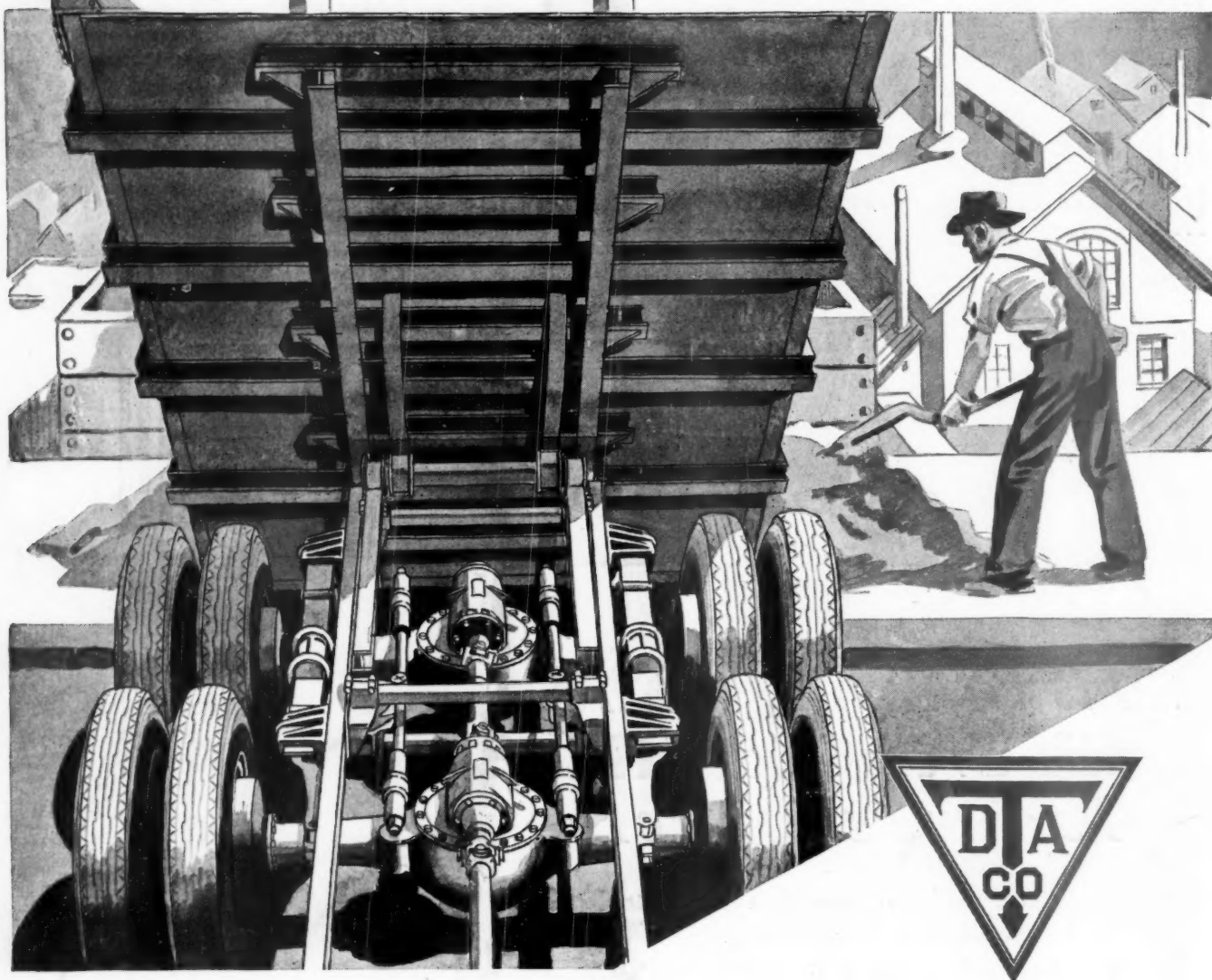
It incorporates all the well-known BENDER Palace Hyway Coach features of safety, convenience and economy... deep, comfortable seats, full head room, inside luggage racks and generous aisle, with advanced modern construction assuring low maintenance.

You can have full particulars. Write, phone or wire.

THE BENDER BODY COMPANY  
W. 62nd and Denison Cleveland, Ohio

# BENDER BODIES

# If ton-mile costs are important— Consider these facts



Much greater capacities. Four driving wheels. Four-wheel brakes—or even six! Greatly increased traction. Complete flexibility—self-adjusting to uneven surface of road or ground. Road shocks tremendously reduced, even under heaviest loads.

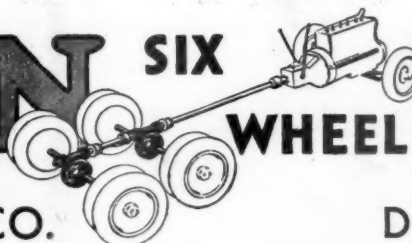
All these advantages are designed in and built into the Timken Six-Wheel Unit, with two Timken Worm Drive Axles driving in tandem.

Motor Trucks equipped with Timken Six-Wheel Units are setting remarkable records for life of equipment and low-cost hauling.

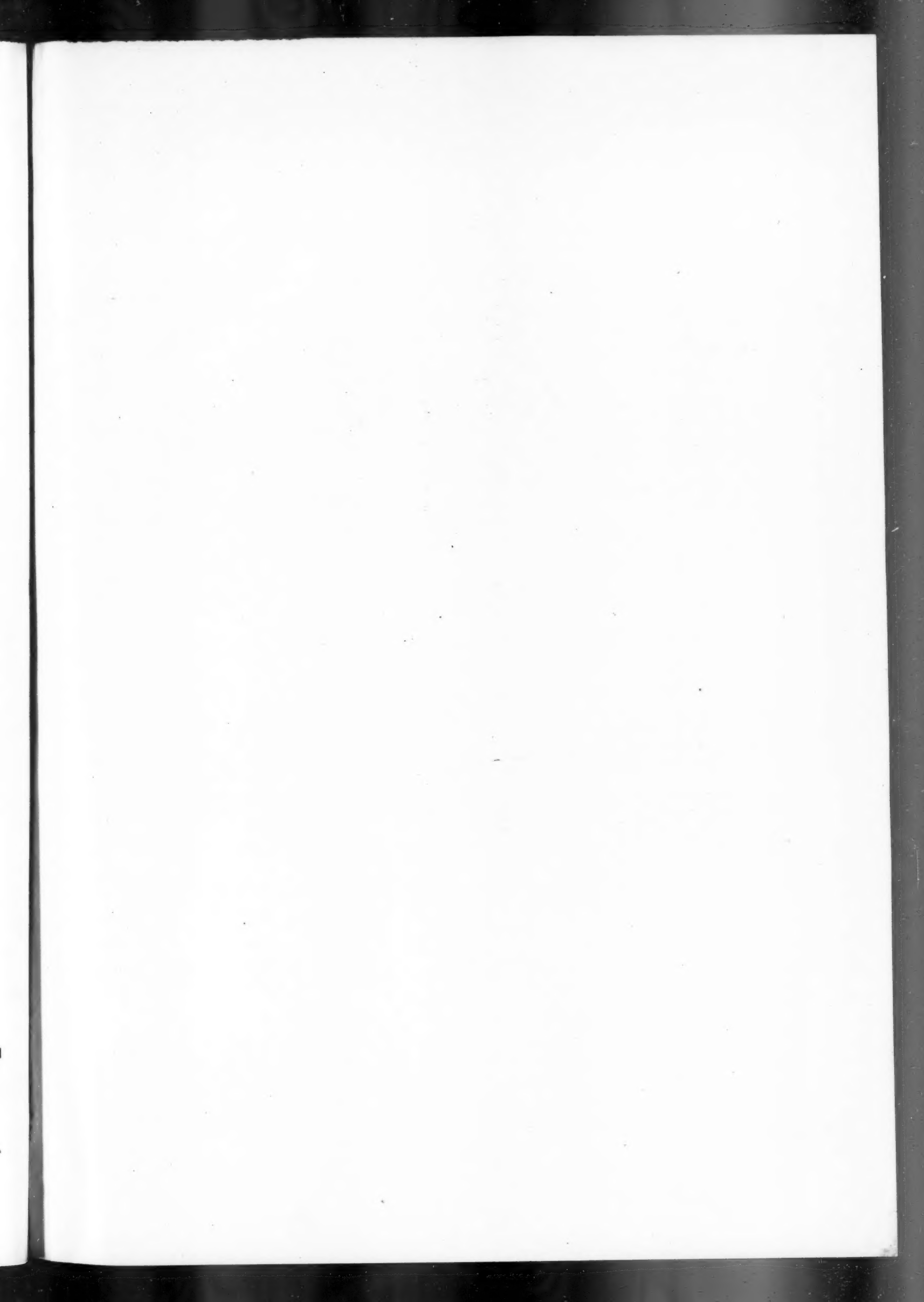
# TIMKEN SIX WHEEL UNIT

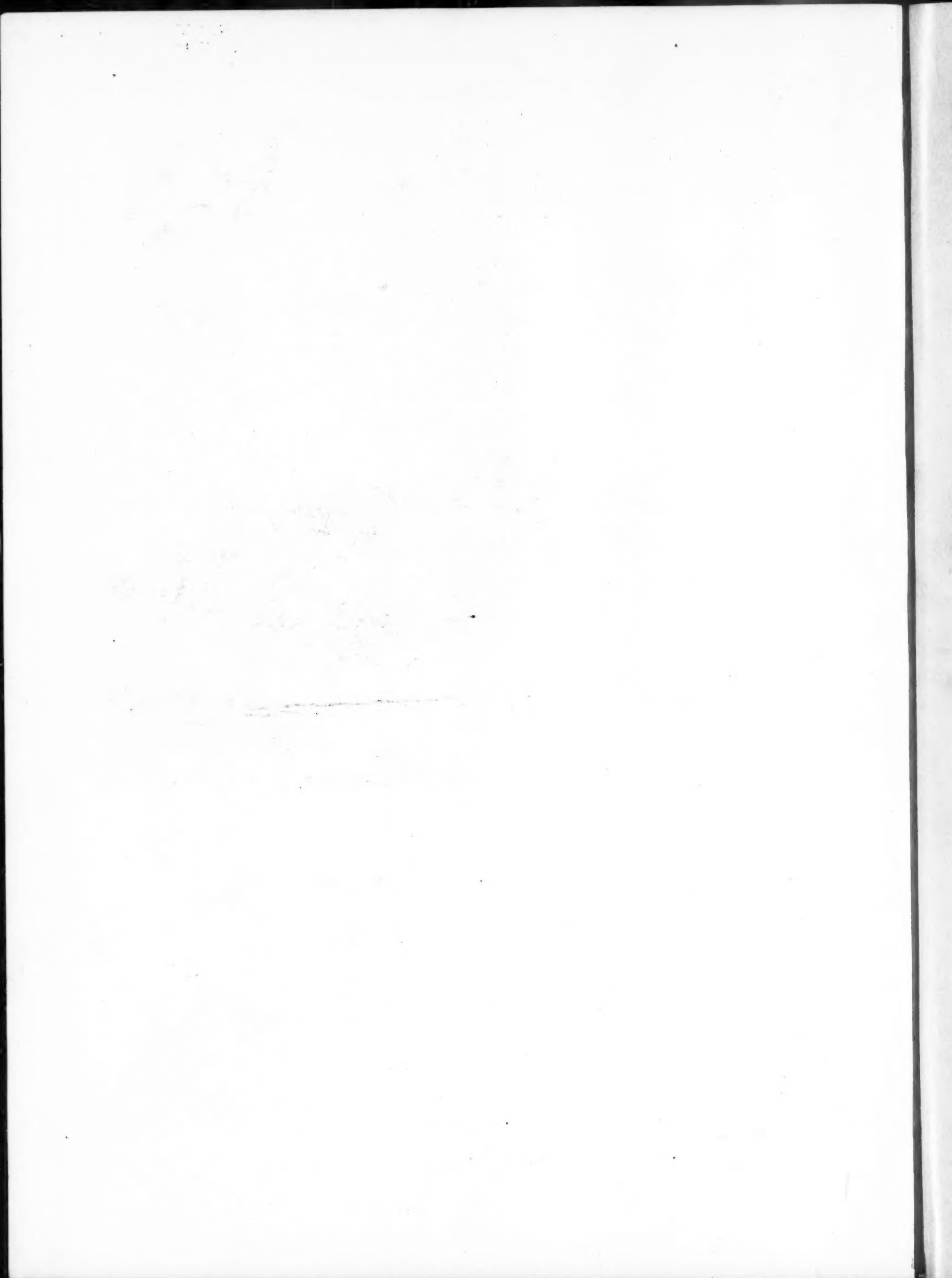
THE TIMKEN-DETROIT AXLE CO.

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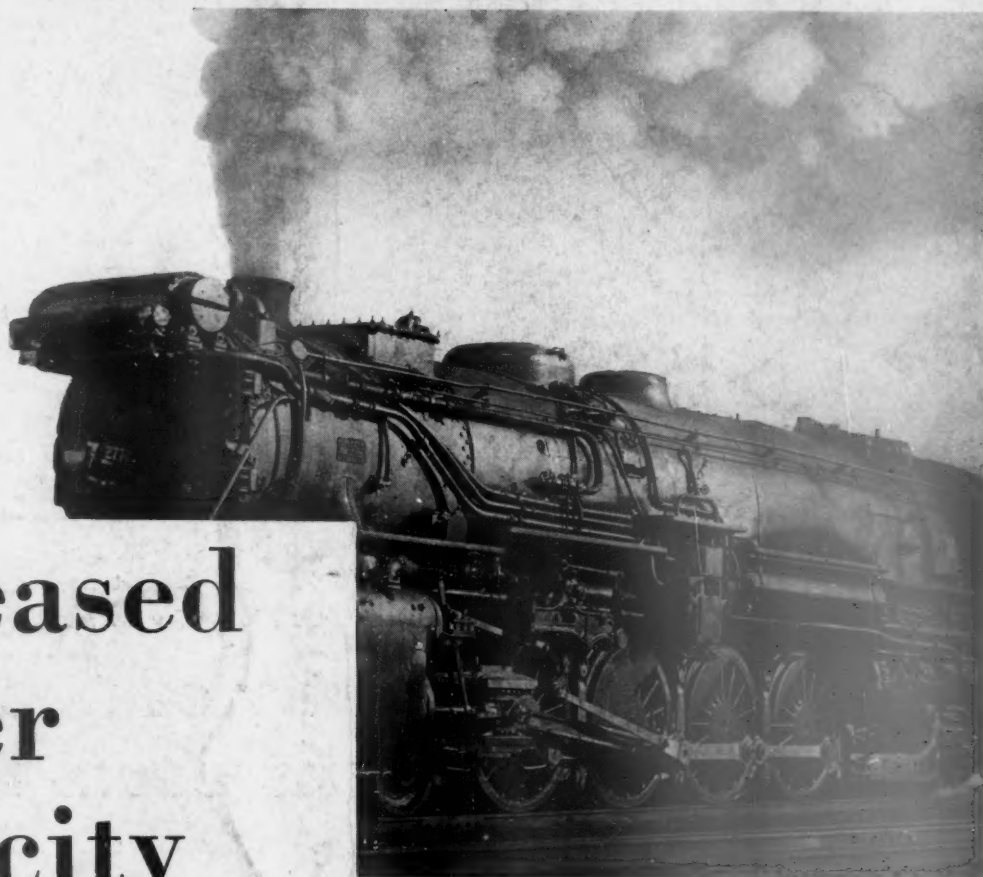


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OCTOBER 4, 1930

# Railway Age

FOUNDED IN 1856



## Increased Boiler Capacity

### Means Increased Net Earnings

Both speed and tonnage are increased by modern power having ample sustained boiler capacity.

Elesco feed water heaters increase the sustained boiler capacity of any locomotive by approximately 15 per cent and this increase is obtained without any fuel cost.

In new power or in old, in large locomotives or in small, Elesco feed water heaters make a ton of coal, a dollar of wages and a dollar of investment yield more in net earnings.

Apply Elesco feed water heaters as your locomotives go through the shops for classified repairs.



Elesco CF Type  
Boiler Feed Pump



The Elesco Heater  
Showing Tubes Partly  
Withdrawn.

## THE SUPERHEATER COMPANY

60 East 42nd Street  
NEW YORK



Peoples Gas Building  
CHICAGO

Canada: The Superheater Company, Limited, Montreal

A-504



## Electrification doubled the capacity of the Mexican Railway and cut costs in half

By doubling the capacity of a 70-mile mountain roadway which had always been the limiting section of the main line, electrification doubled the capacity of the Mexican Railway. In addition, important operating economies were established. These are tabulated below.

	STEAM OPERATION	ELECTRIC OPERATION	Difference in Amount	Advantages of Electric Operation Over Steam Operation in Per Cent
	1921 Sept. & Oct.	1928 Mar. & Apr.		
Number of trains run.....	1,096	1,011	85	8% less trains
Number of cars handled.....	9,238	12,840	3,602	39% more cars
Number of tons handled.....	305,969	416,037	110,068	36% more tons
Number of train-hours.....	4,577	2,718	1,859	40% less train-hours
Number of tons per train.....	279	412	133	48% more tons per train
Number of cars per train.....	8.43	12.70	4.27	50% more cars per train
Number of hours per train.....	4.18	2.69	1.49	36% less hours per train
Cost enginemen's wages.....	\$17,982	\$14,565	\$3,417	19% less cost for enginemen
Cost trainmen's wages.....	14,222	10,721	3,501	24% less cost for trainmen
Cost fuel oil or power.....	36,965	31,140	5,825	16% less cost for fuel
Cost locomotive repairs.....	59,208	5,969	53,239	90% less cost for repairs
Enginehouse expense.....	3,391	1,945	1,446	42% less cost for enginehouse
Lubricants.....	2,776	92	2,684	97% less cost for lubricants
Substation operation.....		2,154	2,154*	
Trolley maintenance.....		856	856*	
Total cost items affected.....	\$134,544	\$67,442	\$67,102	50% less cost for total

\*These items subtracted from total

350-85

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